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APRIL 1965 THE NAVAL [illegible] SAFETY [illegible]

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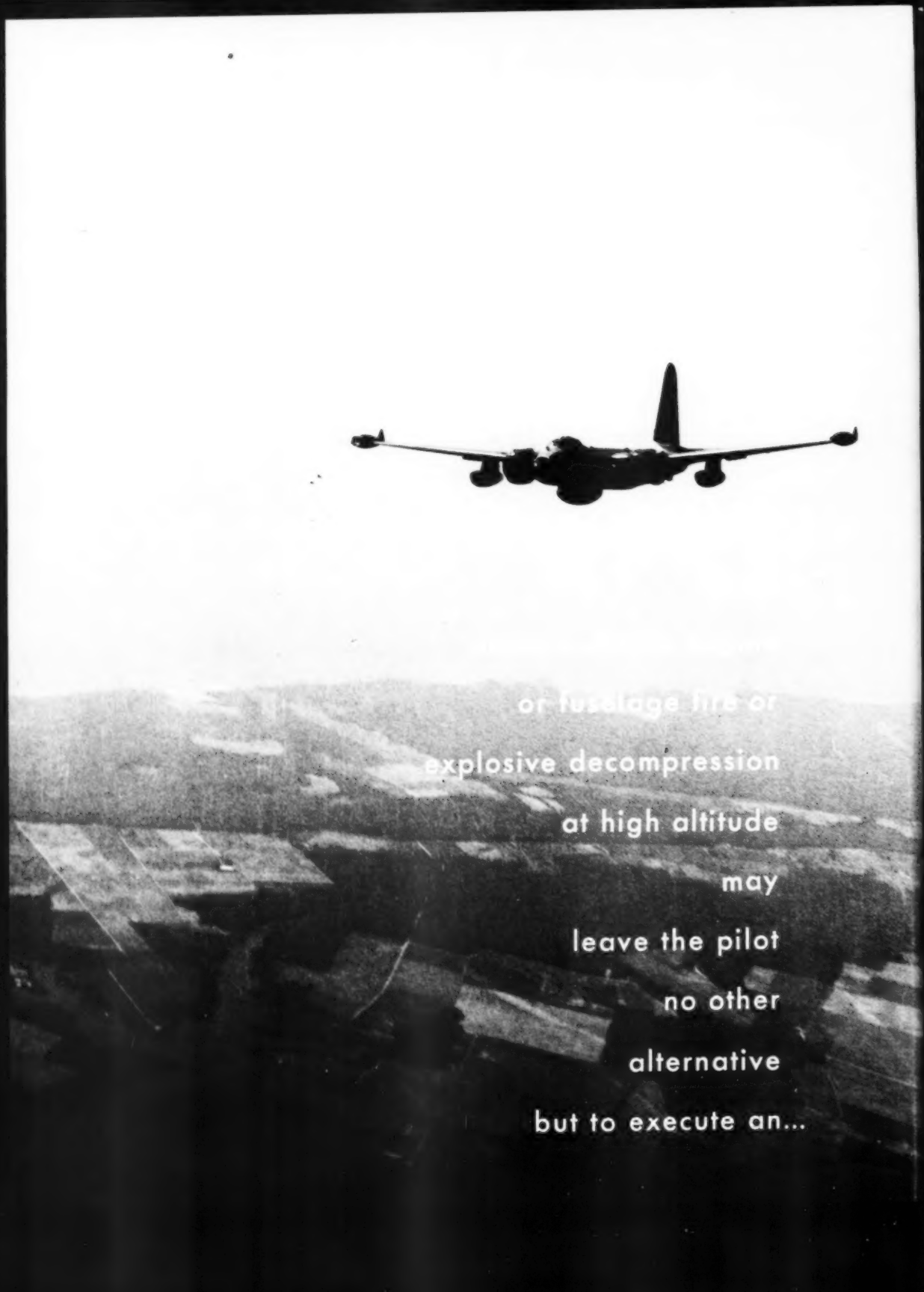
or fuselage fire or
explosive decompression
at high altitude
may
leave the pilot
no other
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but to execute an...

Someday an inflight emergency may force you to fly a big multi-engine prop aircraft down to the surface and execute a forced landing or ditching as quickly as possible. In short, you will have to perform a seldom discussed and practiced, but occasionally useful maneuver called *Emergency Descent.*

If you had to, could you do it right the first time . . . when a practice run is out of the question? Well sure, you might say . . . just chop the power and push over . . . *and in some circumstances, your response would be correct!*

But are there any other considerations?

Not long ago a P-2 pilot was faced with an emergency that caused him to make a rapid descent to the surface. He was cruising at 7000 feet on a night offshore patrol when an intense, uncontrollable afterstation fire broke out. His decision was to ditch as quickly as possible.

A few multi-engine flight manuals (including the P-2 manual) do not discuss emergency descent procedures, but those that do usually promote two primary methods of executing the maneuver.

The first method features a maximum rate of descent and it is accomplished by flying the aircraft down at placarded airspeeds in the clean configuration with engine power at idle.

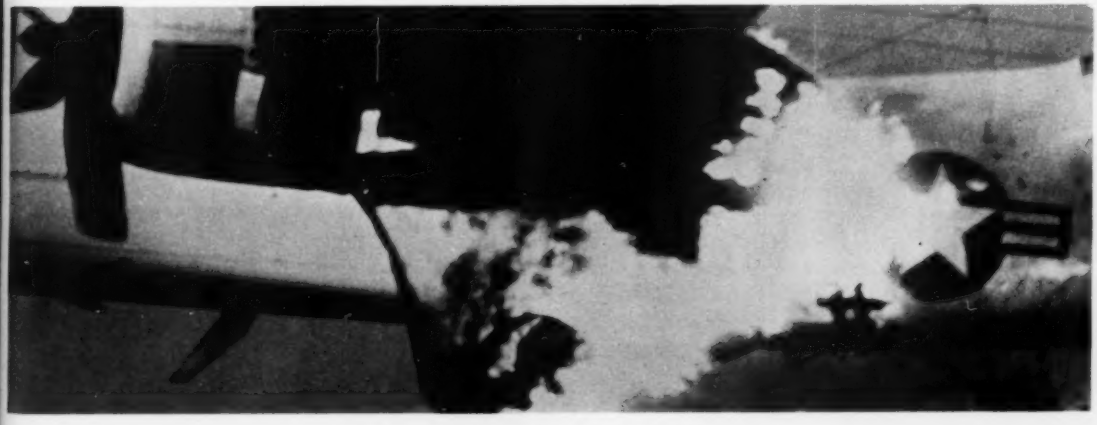
The second method has the advantage of producing a high angle of descent. It can be called the low airspeed, maximum drag (dirty) emergency descent procedure, since gear and flaps are hanging out and the airspeed is maintained within limits for this particular configuration.

The following discussion will comment on some additional advantages, as well as limitations, of each of the two primary emergency descent procedures.

Getting back to the P-2 pilot with the afterstation fire, let's suppose that he decides to descend as fast as possible in the clean configuration.

Several minutes later he is leveling off near the water, thus accomplishing the first part of his objective. But his airspeed by now may be far in excess of that recommended for ditching. So he is faced with two probable alternatives—either risk a high speed impact or hold what he has until his airspeed slows to a point acceptable for ditching. Even if he chooses the latter more logical alternative, additional time is lost while he decelerates to flap down speed and then transitions to the optimum touchdown attitude. Transitions such as this, involving substantial power and trim changes, could prove critical near the surface at night.

In the actual occurrence, however, our P-2 pilot chose to dirty up and descend at limiting speed for gear down and flaps (full) extended. His rate of descent was about 2000 feet per minute, which was nothing to shout about, but he was set up well upon reaching the terminal altitude. And he intended to ditch . . . remember? At 500 feet, he raised his gear



EMERGENCY DESCENT

and began breaking the descent. Passing 200 feet his airspeed was a comfortable 120 knots. In short, he was in good shape to plunk 'er in, which he did, quite successfully, a few seconds later.

The P-2 hit the water just under four minutes after it left 7000 feet. This seems like an impressively short period of time in which to accomplish so much but perhaps you would/would not have done it differently or even swifter. The question arises as to whether a high speed descent with gear and flaps up would have saved a few seconds in this situation, even considering the probable loss of time involved in bleeding off excessive airspeed down at the terminal altitude. Probably not, considering all the circumstances but it's worth thinking about . . . ahead of time.

A C-121J was cruising at 15,000 feet when smoke was observed coming from the rear of the main junction box panel and surrounding area. The pilots donned smoke masks and began an emergency descent toward an Air Force Base some 15 miles to the west of their position.

In this case, the threefold objective was to lose altitude, *reach an emergency field* (a requirement not present in the P-2 mishap), and land as soon as possible. The C-121J Flight Manual proposes three configurations for emergency rapid descent:

- Clean—maximum speed 245 knots.
- Landing gear DOWN and wing flaps in the 60 percent position—maximum speed 165 knots.
- Landing gear DOWN and wing flaps in the 100 percent position—maximum speed 155 knots.

It states further that: "Under emergency conditions, the choice of configuration should be governed by such factors as desired rate of descent, glide angle and maximum airspeed that can be used under the prevailing conditions."

Since distance to the intended emergency landing field was a prime consideration in this case, selection of a descent procedure that could offer a combination of optimum ground speed and maximum rate of descent seemed logical. A high speed moderate drag (clean) emergency descent procedure met the requirement of this situation well.

Let's suppose that this emergency had occurred over or in the immediate vicinity of a suitable landing area. Then, selection of the slow speed, maximum drag (dirty) rapid descent procedure may have been more logical. One flight manual (EC-121K) advocates a preferred method of emergency descent under these circumstances. It states: "Although the chart shows that a clean configuration allows the minimum time to descend, the terminal speed is quite high. If an immediate landing is to be made, minimum time to *descend and land* may be made with gear and flaps full down since no deceleration period is required at the terminal altitude."

The recommended configuration for emergency descent (dirty) in the C-121J is "with landing gear lowered and wing flaps in the takeoff position," maintaining placarded airspeeds. According to the manual, "this configuration produces a steeper angle than the clean configuration, but the rate of descent is slightly less." It also states that: "If rough air, or the possibility of structural damage indicates the advisability of descending at a low airspeed, rapid loss of altitude can be achieved at relatively low airspeeds in this (dirty) configuration. The lower airspeeds also permit earlier execution of smoke removal procedures."

Here is another case of an uncontrollable fire instigating an emergency descent. During an overwater flight fire broke out in the No. 2 engine of a C-117. "At this time," states the pilot, "I called for ¼, then ½ flaps and nosed the aircraft over into a moderate to steep dive in order to expedite the descent. The airspeed did not build up very high because we were already fairly close to the water. I broke the glide with about 120 knots airspeed, called for ¾ flaps, and set up a nose-high attitude, holding this until contact was made with the water." Although the technique used here was not exactly descriptive of the dirty emergency descent procedure for the *Super Gooney*, it was certainly appropriate for the circumstances. Here again, the emergency descent procedure used by the pilot was probably influenced by the aircraft's altitude and

A low airspeed emergency descent is advisable in the C-121J if turbulence or structural damage is present.

condition at the time the emergency occurred, plus the pilot's intention to ditch upon reaching his terminal altitude.

During a night navigation flight in a C-54, fire broke out in the No. 4 engine. The emergency occurred several minutes after the aircraft departed landfall on an overwater leg—altitude 8500 feet. The pilot immediately began an emergency descent and turned to parallel the coastline. During the descent, he hoped to spot an airfield known to be located on an island just off the mainland. If the fire persisted during the letdown, he intended to ditch but if it could be controlled or extinguished, he planned to make an emergency landing at the airfield.

Less than two minutes later, the flaming engine helped determine the pilot's subsequent course of action by dramatically separating from the wing and plunging into the sea. Except for a diminishing shower of sparks around the gaping hole left in the wing leading edge, all traces of the fire had exited with the engine.

The descent was then continued at 1500 feet per minute and terminated at pattern altitude over the airfield, which was now visible. A successful landing was made.

According to the C-54 Flight Manual, the highest possible rate of descent is obtained by:

- Setting power at IDLE
- Setting props at full increase RPM
- Descending at maximum limiting airspeed of 290 knots with landing gear and flaps UP

If conditions such as structural damage or heavy turbulence preclude the use of this procedure, the C-54 pilot is advised to "descend as rapidly as possible" under the following conditions:

- Landing gear and wing flaps DOWN
- Power at IDLE
- Props at full increase RPM
- Cowl flaps OPEN (except for an engine in which a fire extinguisher has been actuated)

Flaming engine dropped off wing of C-54 during emergency descent.

• Maintain limiting airspeed (for this configuration) at 125 knots.

It should be pointed out at this time that if an engine fire becomes uncontrolled, with flames sweeping past the nacelle (on No. 2 or No. 3 engines) the landing gear and wing flaps should not be lowered until just before landing in order to minimize damage to these components and the wheel well area.

Emergency descent procedures are not discussed in S-2 Flight Manuals, possibly because the bulk of operational flying in this aircraft is near the surface anyway. It seems however that the *Stoof* pilot should have a sound knowledge of the emergency descent procedures applicable to his aircraft even if he does fly below 5000 feet most of the time. Consequently, it may be well to indicate at this time that the procedures discussed thus far could apply as well to the S-2 aircraft.

A situation requiring an emergency descent could be created by rapid decompression in aircraft such as the P-3 or C-130.

The P-3 flight manual advises an emergency descent from high altitudes in the clean configuration in order to obtain the highest rate of descent. It states further that: "If conditions require lower speeds, descent may be made with landing gear and flaps extended. This produces the highest angle of descent."

The emergency descent procedure for the C-130 "is with the landing gear and flaps extended." In this configuration, airspeed limitations for landing gear and flap extensions would be applicable. The C-130 manual further states that: "If decompression occurs and no structural damage results, the pilot may elect to make a descent in the clean configuration." One point to keep in mind is that the C-130 can descend about twice as fast in the clean configuration as compared to a rapid descent with gear and flaps extended.

The Flight Safety Foundation raises some interesting points in commenting on action appropriate for commercial jet pilots upon experiencing a rapid decompression. It suggests that "a pilot *may not* dive immediately because:

• He will first want to see if it is safe to do so. (In the case of one commercial jet liner at 20,000 feet, the pilot first studied the situation for some 60 seconds—16 feet of fuselage had been torn off.)

• If it happens over a high-density area, there is danger of a midair collision in a fast dive.

• If it happens near midpoint on a long overseas flight, fuel consumption may dictate remaining above 15,000 feet in order to make land.

• If storms and extreme turbulence are present at low altitudes, fear of loss of control or of further structural failure may be a consideration."

A high airspeed, moderate drag (clean) descent is recommended by the Flight Safety Foundation in the event of rapid decompression, assuming the absence of structural problems or extremely turbulent air.

Specific reference to other types of multi-engine prop aircraft has been purposely omitted because inclusion of their emergency descent procedures would serve only to parallel what has already been said, and thus involve needless repetition.

A worthwhile, though hardly attainable goal of any pilot would be to foresee and preplan for every conceivable type of emergency that might confront him while airborne. Falling short of this, an attempt has been made, in the case of emergency descent, to discuss adequately the two principal methods of executing this maneuver and to imply that under certain circumstances, one procedure might have appreciable advantages over the other with respect to shortening the time required to descend to terminal altitude, minimizing further airframe damage during the descent (assuming structural weakening or failure caused by the emergency) and facilitating prompt execution of the pilot's intentions upon reaching the terminal altitude.

The clean configuration gives the maximum rate of descent in the P-3. If conditions require lower speeds, descent may be made with landing gear and wing flaps extended.

If the Shoe Pinches

We've all seen cartoons of women shopping for shoes. They sit, feet extended, while exhausted clerks scramble through litters of boxes, tissue, and discarded samples. Only after they've tried on dozens of styles and colors do they select a pair of size five, needle-nosed pumps and squirm and shove to get their size seven feet into them. Aching like mad, they mince away, happily convinced their appearance is all that matters.

Some of us shop for safety the same way these women shop for shoes. We keep trying on safety programs until we find something that looks good. Then we buy it, with little thought for whether it fits or pinches our aviation operations.

Like the ladies, we wear our safety with great pride while anyone is watching. But let us get in the privacy of our own bailiwicks, and off come the shoes and safety. We wiggle our toes and heave great sighs of relief. Now we can operate!

Why does a safety program pinch? It pinches because we substitute *don't!* when we can't answer *how?* It pinches any time there are unnecessary restrictions.

It pinches because we often find ourselves in the same rut that automotive safety has been in since we started paving roads. Let a holiday weekend come along and the news services are filled with predictions of doom. They tell us how many will be killed and maimed. They do their best to scare us into staying home and if that fails, they tell us to "Drive Safe!" Not *how* to drive safe, but "Drive Safe!" In the meantime, we go on building 100 mile-an-hour cars for 60 mile-an-hour roads and 40 mile-an-hour drivers.

Negative safety has never worked for cars and it damned sure won't hack it for aircraft. I defy anyone to show me how wearing a set of *don'ts* can prevent accidents and still let military aviation do its job.

We can't afford to let ourselves to be scared by negative safety into staying on the ground. We can't afford to restrict our operations in any way. We need a positive safety program that fits—a program that will extend our operational capabilities.

We need to examine our equipment. Does it operate like it's supposed to? Is it reliable? Does it place the least possible demands on our crews? If we get a "no" answer, we need to show how and why and get the equipment changed.

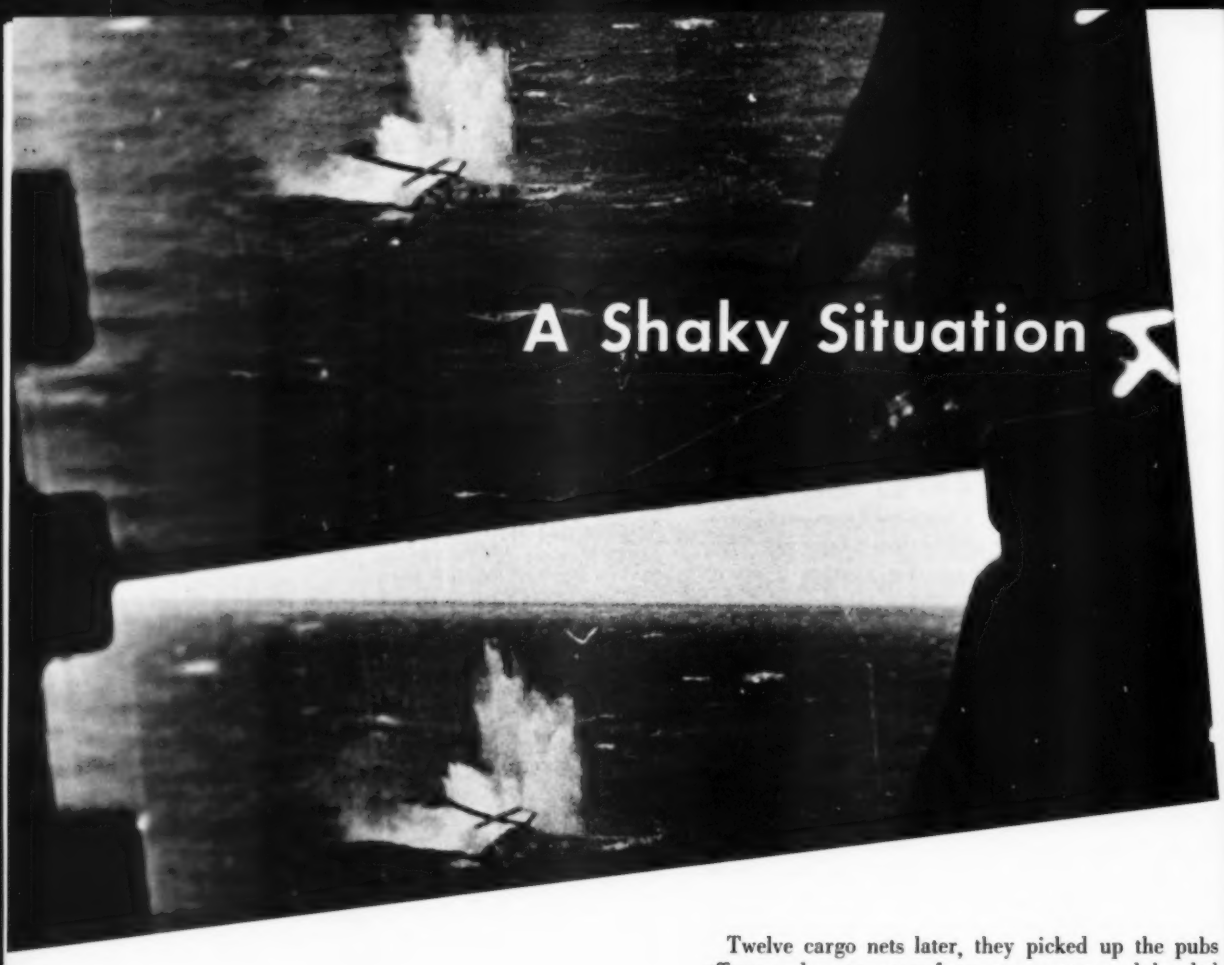
We need to examine our training. Are we training our crews to do every part of every job the way it should be done? Are we standardized? If we're not, let's find out why and make changes.

We need to examine our operations. Are we doing everything the way we should? Here again, are we standardized? If not, let's do something about it.

We need to examine our facilities—our control towers, weather services, approaches, runways, taxiways, and the hundreds of other items that play a part in positive aviation safety.

We need continuing surveys of our equipment, our people, and our facilities. When we get these, and when we get immediate corrective action, we'll have positive safety.

Right now is a good time to check for signs of corns and bunions. If your safety program pinches your operations in any way, then you've bought the wrong program. It's time to get rid of it and step into some surefit seven-league boots with a positive approach to safety.—*Reprinted from United States Army "Aviation Digest"*



A Shaky Situation

The UH-34E and crew were scheduled to launch off the mothership, USS GUIDE, an AKS, with a load of supplies for USS BIG HOUSE, an LSD. They also had to drop an RPS custodian at BIG HOUSE and return him safely to GUIDE after he had delivered his mystic journals. The pilot estimated that the operation would take 12 trips including the round trip for the pubs officer.

It was a clear morning, good visibility and a heavy six-foot swell that lazily rolled the flight deck ever so slightly as the formation steamed east. They didn't have far to go; BIG HOUSE was underway at 13 knots just 1000 yards off the port beam.

The launch was at 0715 and they proceeded directly to BIG HOUSE where they settled momentarily to off-load the passenger. Launching again, they returned to GUIDE to commence the Vertical Replenishment Operation. Everything was going well, both helo and crew were performing flawlessly.

Twelve cargo nets later, they picked up the pubs officer and cargo gear from BIG HOUSE and headed for home.

Final approach and landing at GUIDE seemed to be uneventful.

The pilot eased the collective to full down, RPM was approximately 2400 and slowing as he split the needles. Crewmen were just beginning to approach the helo to put on the tie-downs when things suddenly turned sour.

"At this point, I felt a vibration through the aircraft that increased in intensity and violence much more rapidly than we were able to react," the pilot stated. "I was being thrown from side to side with such force, that movement was extremely difficult and the flight deck, ship, and instrument panel became a blur."

The helo was shuddering and rocking about 30 degrees from side to side. Sudenly it started skidding across the small flight deck.

Doing some fast thinking, the pilot immediately recognized the potential dangers inherent in the situ-

ation; namely, overturning on the flight deck, falling overboard, fire and possible explosion with flying pieces of disintegrated rotor blades everywhere.

Both pilot and copilot cranked on throttle and yanked up collective in an effort to clear the deck. The helo gyrated wildly as it strained for altitude.

"When finally airborne we shook for about ten seconds just as violently as we had on the deck and ended up about 100 feet above the deck facing aft, with 1900 rpm and 54 inches of manifold pressure. RPM recovery was normal."

Once stabilized, the helo flew well with no apparent damage other than engine overboost.

"We then circled the ship and made several approaches and attempts to land using varying RPM. All efforts to land were the same. We found we could touch the main gear lightly to the deck, but the smallest amount of weight would cause ground resonance."

The pilot even attempted a landing aboard the larger, more stable flight deck of BIG HOUSE—no joy.

During subsequent landing attempts control had become progressively worse. In all probability, the initial ground resonance, induced by touchdown on the pitching deck had damaged the main rotor hub assembly, resulting in a one to one vibration (*1 vibratory cycle per revolution of the main rotor—Ed.*) of increasing amplitude for the remainder of the flight. The pilot decided to try a few more landings, but without the pubs officer and the crew member.

Hovering low over GUIDE, he held the chopper steady as the crew member and the pubs officer jumped to the deck below.

They tried a few more landings without success.

"By now there was a pronounced strong one to one vibration and control of the aircraft was becoming more difficult. At this time we decided that ditching was inevitable."

Hovering low over GUIDE once more, the pilot tried to hold the helo steady while his copilot jumped. In clambering out of the copilot's hatch, the copilot tripped on the cyclic causing the chopper to jerk forward and up about 20 feet. From this all but graceful position, he half fell and half jumped to the cluttered flight deck below. In the leap, the copilot slightly injured his hand and ankle.

The pilot circled GUIDE a few times as the ship stopped and lowered a boat. BIG HOUSE assumed a plane guard position and also lowered a boat.

"During this time, I made several attempts to buckle on the 'back pack' raft, but by now control vibrations were such that the aircraft demanded my full attention. As a result I jammed the raft between the instrument console and the windshield." (*This enabled him to devote both hands to the flight controls—Ed.*)

"I entered a hover into the wind about 100 yards off the starboard beam and slowed my RPM to 2200 at the same time lowering the main gear into the water. When the gear was fully submerged, I split the needles and pushed the cyclic to the left.

"As the blades hit the water the fuselage flipped up and rolled to the right. It started sinking immediately at an angle of about 60 degrees, nose-down and left side up.

"I reached for the raft, but let it go, as I felt I needed both hands free to pull myself out of the cockpit. Once out, I pushed off the side of the aircraft and swam to the surface before inflating my life vest."

In three minutes a boat from GUIDE picked the pilot up. The helo sank in 2100 fathoms.

The accident board concluded that the pilot's decision to ditch was valid, especially in view of the increasing amplitude of control vibrations, the limited size of the helo platform, the hazard to all personnel concerned, and the lack of complete aircraft fire fighting facilities aboard the AKS.

The pilot's decision to evacuate the copilot and ditch the helo by himself shows concern for the welfare of others, but is worth discussion. In ditching the UH-34E, it appears that rather than rolling to the left, as was done in this case, the better procedure is to continue to apply up-collective to slow the rotor and apply rotor brake to stop the rotor. Could the pilot do this alone? Doubtful! In this accident, it may have been better for both pilots to remain with the aircraft. This would have provided assistance to the pilot in ditching, provided mutual assistance in evacuating the aircraft with survival gear and aid in the event of injury. Emphasis on this procedure is made in view of the increasing difficulty the pilot experienced in controlling the aircraft and the resulting fatigue factor.

Some NATOPS procedures were violated in that the first landing after the Vertical Replenishment Operation had been completed the rotors were disengaged before the deck crew had the tie-downs attached. Additionally, while not in NATOPS a subsequent endorser suggested that the pilot should have attempted a landing with deflated tires prior to the ditching.

By LTJG R.G. McCauley, HU-4

CRUISER ☒ HELICOPTER

Successful helicopter operations from a cruiser, and especially a missile cruiser, require the utmost in pilot technique and concentration. The pilot is faced with so many unique experiences and situations that the challenge is tremendous.

First, let's take a look at the landing deck. It's relatively small and always unstable in anything but calm seas.

A view of the area surrounding the landing deck reveals a jumble of sundry obstacles such as bitts, chocks, exhaust vents, foxing gear, telemetering towers (plus their stowage coffins), fuel hatches and fire hose racks.

Just a bit forward of the landing deck often sits the awesome missile launcher and beyond it is the missile house and superstructure. These objects are to be avoided at all costs. Unfortunately, their bulk converts the slightest wind zephyr into a turbulent unpredictable air mass.

Let's consider the wind for a moment. According to NATOPS, the relative wind should be 10 to 60 degrees off either side of the bow and 30 to 45 degrees off either side of the bow is the preferable condition under normal operating conditions.

A relative wind off the starboard bow requires fewer left rudder applications (during an approach) than would be the case if the wind were off the port bow. This is quite important to the UH-2B in extreme wind conditions because of the dampening effect of the rudder system and the aircraft's chronic lack of adequate left rudder.

The pilot must be able to counteract the effect of torque as his aircraft is transitioned to a hover prior to touchdown. When an approach is being made into a port-side wind, left rudder must be available to maintain heading as right cyclic is introduced to

ROPERATIONS

Top left—Destroyer helo pad is clean but smaller than cluttered cruiser landing area (top right). Each type of deck becomes a special problem. Above—Under extreme wind conditions a relative wind off the starboard side of the ship requires fewer applications of left rudder.

maintain relative motion with the ship. Left rudder is also required in this situation to combat the strong weather cocking tendency encountered when the wind is less than 30 degrees off the bow (port) and greater than 20 knots.

It is not unusual for the ship to steam at 22 to 25 knots for an extended period of time. Consequently, if the pilot is operating close to maximum power available in order to hover and the relative wind is off the port bow, it may be virtually impossible for him to get aboard prior to running out of left rudder effectiveness in some helos.

One disadvantage of an approach into a relative wind on the starboard bow is that the pilot has a restricted view of the obstacles forward of the landing area.

Turbulence plays a major role in the approach to a landing. It is usually encountered first at approximately 20 yards from the ship as the wind burbles over the deck. Closer in, severe turbulence is encountered. This effect is caused by the missile house and launcher. Rapid rudder imputs may be necessary at this point in order to maintain heading control, which is most critical because of the prox-

imity of obstacles on the fantail. Once the chopper's tail is below the height of any of these obstacles, complete heading control is mandatory in order to avoid a collision.

If the pilot is unfamiliar with the deck and its surroundings, he will find that several approaches and landings will be necessary before an exact perspective of the environment can be developed. Therefore, during these initial approaches he should follow the landing signalman's directions to the letter, particularly after the aircraft is in position over the landing area and about to touch down.

In any approach, the pilot must rely heavily on the landing signalman to inform him when the aircraft's tail is clear of obstacles lining the deck edge, such as chocks and bitts.

When the aircraft is in position over the landing area, very little, if any, of the deck is visible from the cockpit. At this point, about all the pilot can see is water. This strange perspective has in several instances led pilots to land short after believing themselves to be completely aboard. At best, this short landing maneuver terminates with the tail wheel in the safety nets.

Something else to be considered during the approach is the altitude at which the aircraft arrives over the deck. If the pilot comes in too high, he may lose sight of the landing signalman and a number of reference points. If he is too low, ground effect may induce a tendency to balloon. Ballooning can lead to rapid control inputs at a point in the approach where all movements must be smooth and precise, unless the pilot anticipates this possibility and is ready to compensate for it. The recommended over-the-deck altitude is six to eight feet.

Thus far we have discussed deck layout and size, turbulence, wind direction and velocity, visibility and altitude over the deck. All of these factors influence the pilot's decision as to the type of approach he will make.

There are two methods for coming aboard. Each has advantages and disadvantages.

There are two basic types of approaches:

- Maintain translational lift as long as possible and terminate in a flare over the deck.
- Come in slower and flatter.

Whichever approach is selected, it is to the pilot's disadvantage to spend an extended period of time in a position partly over the deck and partly over the water.

Let's take a close look at the first type of basic approach mentioned—that of maintaining translational lift as long as possible and terminating in a flare over the deck. The advantage of this approach is that a minimum amount of time is spent with the aircraft partially over the deck and partially over the water. Its disadvantages are:

- Extra altitude must be allowed to compensate for the tail-low attitude assumed in the flare.
- During the flare the pilot will lose sight of his reference points and the landing signalman.
- In a relatively fast approach such as this, there is less time for the pilot to react to the turbulence encountered.
- There is no opportunity to establish hovering power prior to arriving over the deck.

Coming in slower and flatter has its good and bad points also. The advantages of this type of approach are:

- It allows the pilot more time to react to the effects of turbulence.
- It affords better observation of reference points and the landing signalman.
- Large and relatively rapid control inputs are not necessary since a flare is not executed.

Top—Pilots operating from cruisers may envy the deck size of the carrier but a crowded flight deck is about the same as a saltwater heliport (below).

• Power over that required to hover is established prior to arriving over the deck, in the event a wave-off is required. This approach has one drawback however, in that more time is spent in a position straddling the cruiser deck and the water. This hazardous condition can be minimized by making a positive movement to get the aircraft completely aboard.

All things considered, a slower flat approach seems to be more advisable than one terminating in a flare. In the event of an engine failure during the approach, the pilot has more of a chance to execute a successful landing if he is in a flat attitude at low airspeed. Conversely, should an engine failure occur during an approach involving a flare, the pilot might not be able to reduce his airspeed in time to avoid colliding with the ship.

Should an engine failure occur during an approach, the best situation the pilot could be in, recovery-wise, would be to have the aircraft heading into a relative wind off the starboard bow. Then when the engine failed, the initial yaw would be to the left, thus turning the aircraft away from the ship. But, should an engine failure occur during an approach into a relative wind off the port bow, the aircraft would turn perpendicular to the ship—an unhappy situation.

In the case of the UH-2B, the pilot must put the aircraft weight on the landing gear immediately after touchdown by getting his collective full down. This is necessary to prevent deck slipping and to put the aircraft through the resonance range quickly. The possibility of resonance at any time exists when the aircraft is at high gross weight, about 90 percent airborne and when rotor RPM is around 103 percent. Down collective is usually accompanied by a tendency for the nose to tuck under, but this can be counteracted by a slight application of back cyclic.

Takeoffs are not quite as critical as landings. But here again heading control is of utmost importance in order to avoid striking the tail wheel against obstacles on the after area of the deck.

It is advisable to spend as little time as possible in a hover over the deck after lifting off. The pilot must continually scan the instruments as power is being applied, and once airborne, maintain relative motion with the ship until he is clear of all obstacles.

In the UH-2B, the copilot should raise the landing gear as the aircraft passes over the deck edge and then stand by to actuate the flotation bags until adequate airspeed and altitude have been attained.

Launching and landing aboard a cruiser is demanding flying, both on pilots and aircraft alike. It will behoove the novice and uninitiated to be aware of and have respect for the many factors involved, any of which can lay waste to the best laid plans for a normal approach.

Thunderstorm Penetration

TRUTH and CONSEQUENCES

The *Crusader* had already been successfully test flown by the manufacturer and now it was time for the BuWeps acceptance hop.

The launch was at 1300 and during climbout, the pilot ran the flight airworthiness check and declared the plane satisfactory. He reported:

"I proceeded west in a slight climb to 40,000 feet to make a supersonic run in the flight test area.

"I had the autopilot engaged but did not have altitude hold on. There were numerous thunderstorms below me. Up ahead was a monstrous storm, extending well above 40,000 feet. I started a slight left turn and evidently let my airspeed drop off. I noticed the airspeed to be about 180 knots and added full power." The pilot reported that he felt the aircraft chug, as if undergoing an engine compressor stall and he immediately began reducing throttle slowly.

Four or five chugs later the pilot shut down. Although he had over 600 hours in the F-8, this was his first compressor stall.

"I leveled the wings and pushed the nose over. By this time I had the RAT out and turned ON, checked the instruments and looked up ahead. I was in a blind canyon of thunderstorms! I had no choice but to enter them."

At 37,000 feet the *Crusader* glided into the monstrous thunderstorm that had been looming up ahead.

"The ride from then on was practically indescribable."

The pilot concentrated his efforts on keeping the wings level and nose down in a glide attitude. This was virtually impossible.

"I couldn't keep the wings level within 60 degrees and the nose would violently pitch up and down 30 degrees. The airspeed was reading 0 to 70 knots. This, coupled with the violent lateral oscillations, gave me the sensation of being in a spin."

"I tried to blow the droop down but couldn't because of being thrown around so violently. Sometime in there I remember hitting the igniters and bringing the throttle around the horn.

"At about this time I remember a blinding flash that knocked me out. It was similar to grabbing a hot electrical wire."

When the pilot woke up the aircraft was dropping through 12,000 feet.

"In panic I remember thinking I had to get out of this and for some reason, I'll never know, I reached up and ejected the canopy. With the same motion I also reached for the face curtain."

The wind and rain blasted into the open cockpit with shocking ferocity.

"The wind must have brought me back to my senses as I hesitated with my hand on the curtain and remembered the story of the fella that bailed

Intensity of turbulence is indicated by the accelerometer readings.

I reached up and ejected the canopy.

out in a thunderstorm. I thought if I bailed out here I wouldn't be any better off, so why not ride it down farther."

"With one hand on the stick and the other on the curtain, I broke out of the side of the storm at 8,000 feet."

Somehow the engine was running! The pilot called approach control and told them the situation and that he was headed home. The trip and landing was uneventful even though he had no canopy and climbed to 23,000 feet enroute to avoid some storms.

Postflight examination of the airframe revealed some minor damage due to canopy separation and erosion of various areas due to rain, hail and windblast. The G indicator recorded 6.8 positive and 4.9 negative Gs.

Minor burns from lightning discharges were found on the trailing edges of both wing tips and the left hand UHT tips. Further confirmation of the lightning strike came from the examining physician who checked the injuries on the pilot's left hand and forearm. There were about 25 small cuts on the lower side of his left forearm and six blisters on his hand between the wrist and small finger. The left sleeve of his flight suit and his leather glove was also perforated by numerous small holes in the area of the injuries. This indicated that the electrical current passed from the pilot's hand to the cockpit structure. The APH-5 helmet was marked in several places where hail at high speeds had chipped off helmet paint and superficial lamina of the hard hat itself.

The Funny Looking Fudds

By LT R. A. Sage, CIC Officer, VAW-12

For two consecutive months APPROACH contained two separate and distinct survival narratives that contain a common denominator. The two articles are "Post Midair" in the September 1964 issue and "3 Who Pulled the Curtain" in October 1964. The common denominator is the first arrival on the scene of these separate ejection incidents.

Before we go into specifics concerning these occurrences, there is another fine article which every aviator should read concerning the mysterious inner workings of the magic black box called IFF. This article, "The Great Murgatroyd Frunch (IFF) SIF Scandal" (APPROACH February 1963), spells out procedures to summon aid when trouble brews in the blue. This article tells of controlling agencies such as GCI sites, Air Traffic Control Centers, Air Defense Command and NORAD, all of whom can lend assistance when you place that master control on EMERGENCY and also squawk Mode 3 Code 77. One problem here, however: home base is USS BIRDFARM in the middle of mega-acres of water with nary a GCI site within line of sight.

True, USS BIRDFARM is watching its radar scopes as your own personal floating GCI site. But there is another source of radar aid that can not only see your IFF EMERGENCY squawk and fix your distress position but also has the ability to get to that distress position in a hurry.

Let's take a look at this other radar source and see exactly what it has and what it can do for you in case of an impending ejection over water.

- It can see your EMERGENCY IFF squawk on its radar (repeated for emphasis!).
- It can get to the distress position in a hurry (well worth repeating!).
- It can use its radar to fix your position by reference to land marks, nearby shipping, navaids and other aircraft.
- It has two UHF sets that can be used to tell other people about your troubles and/or position.
- If it has those two UHF sets you can bet it can hear your pleas for assistance on the GUARD channel.
- It also has an HF radio to add distance to rescue communications.
- It can relay UHF communications automatically between the far distant USS BIRDFARM and shore stations where distance precludes direct UHF communications.
- It can circle your position for hours at low altitude and low airspeed to keep your raft in sight.
- While doing the above low altitude, low speed circling it will be yelling its head off for help and can even use its radar to direct that destroyer right up to your raft.

• If it can direct a destroyer to your position it stands to reason that it can also direct other aircraft to that position.

• If it can vector ships and aircraft, it can also help you get back to the barn if your navaids are malfunctioning.

As a sidelight—when you eventually get back to USS BIRDFARM, this critter will be there so you can sit down and talk the whole business over. It lives there, too.

Going back to the two articles mentioned, one incident happened in the Pacific and the other in the Atlantic. Same situations—ejection over water, a ride in a raft, poor visibility and/or night prevailing—but yet the first sight of impending rescue was the same. This sight is not unfamiliar on and around carriers on both coasts even though as a sight by itself it will win very few "what a lovely airplane" contests. Of course we are referring to that apparition that looks like a flying saucer running away with a *Stoof*—the E-1B, or more affectionately known as the *Willy Fudd*.

It might be worthwhile to mull over the points listed above the next time you are reviewing those emergency procedures. In an emergency the basic tasks of letting someone know about your troubles and setting that IFF on EMERGENCY, time permitting, are still as good as money in the bank. The interest rate on that money goes up considerably when the *Willy Fudd* is around.

The *Fudd* may be a funny looking character but its sole purpose is to put that radar and communications gear to good use. What better use can there be than to give a helping hand when trouble arises.

If you have specific questions about how the E-1B can render assistance, drop in at your nearest *Fudd Farm* and talk about the funny looking *Fudds*—the aircraft, that is, not the people. You'll find the people quite normal looking, easy to get along with, and quite concerned about your welfare.

CRASH

Recipe to spice up a dull day: Take (1) a pre-accident plan and (2) a station operations officer. Mix thoroughly, throw in a dash of imagination and let simmer.

Depending upon your attitude towards the problem, the result can be a rousing drill problem, big enough to serve *all* station rescue units.

A drill of this nature was conducted at MCAS ——— last spring and since the objective was to exercise as many of the Rescue Service Division units as possible, an off-station problem was selected.

Realism was a guiding principle but considerations for safety of personnel, equipment, and property was mandatory. For example, the time was selected with the intention of alleviating the danger of having school children in the area. Also, sufficient strength had to remain at the air station to take care of normal commitments.

An important element was the selection of the "crash" site and the cooperation of the owner of the land. The final location was ideal for the setting of a controlled fire and offered a good cross section of the normal obstacles that would be encountered during an actual off-station crash.

A key member from each of the Rescue Service units was selected and briefed to act as umpire. These men would receive advance notice of the date and time for the drill. To get maximum benefit from the situation a critique would follow the drill.

At 1330 the balloon went up, or more precisely, the phone in the ODO's office rang and the following message was transmitted: *"This is a drill.* Two A-4s with ordnance aboard have had a midair over Point Echo. One aircraft has crashed on land beside the boat docks; the aircraft is burning. The other aircraft was observed heading out to sea, on fire and out of control." In the drill message the mark number for a nuclear weapon was given.

At this time the normal sequence of events associated with an off-station crash were expected to occur. The individual units were to respond and comply with their existing orders, good judgment and common sense. If things were observed to be getting out of hand the key men were to take the necessary corrective action.

The units directly involved included:

- Crash Crew
- Crash Boats
- Search and Rescue
- Operations
- Medical Department
- Provost Marshal
- Explosive Ordnance Disposal

How did the exercise go?

It was considered the mission was satisfactorily accomplished; however, each unit responding to the drill had trials and tribulations. It is these problems, large and small, which are of interest. MCAS ——— found them *before* they could possibly become a critical factor in an actual crash. Since other stations may want to take note of the details as a check against their own preparation, some items are listed below.

Crash Crew—Information which was passed to crash crew was incomplete and location was not passed in coordinates. . . After trucks turned onto highway the tower informed them of the correct location.

At the crash scene an attempt was made to call the tower for Explosive Ordnance Disposal (EOD) assistance, however, the command vehicle's radio could not raise the tower. M.P.s were informed and

'He who stops being better, stops being good.'

—Oliver Cromwell

Exercise

they went out with the request. Enroute back to the station attempts were made to contact the tower at ¼ mile intervals. The tower was raised when the vehicle was about a mile from the main gate. Recommend that the grid system be utilized by the ODO and tower in passing locations.

Explosive Ordnance Disposal—Due to lack of assigned transportation it was necessary to request transportation from Motor Transport Pool. Only appropriate hand tools were taken due to a report of the aircraft being armed with rockets. Had no communication while enroute. Recommend that a 4-wheel drive vehicle equipped with radio be permanently assigned.

Provost Marshal—Some emergency vehicle drivers labor under the misapprehension that a red light and a siren guarantees the right of way through traffic. Recommend that operators of emergency vehicles receive schooling in the operation of these vehicles in civil traffic.

Crash Boats—There was little confusion encountered in the initial moments of the drill but when the "rescued" pilot presented a summary of simulated injuries, the techniques of first aid were bad (fractures treated before bleeding wound). The initial helicopter pickup was rough. Recommend crash boats be refreshed in first aid procedures and regular drills be scheduled for boat and helicopter cooperation.

Search and Rescue Unit—The information concerning the location of the crash site and aircraft armament was incorrect; no mention of the A-4 heading out to sea was given. Handling of the crash victims was frustrated by the restraint and heat inherent in the wearing of the anti-exposure suits (actual air temperature 52°, simulated air temperature 30°).

Lack of familiarity in maneuvering a victim within the confines of the helicopter cabin compartment was also apparent. Recommend that drills should include the handling of inert victims and all support equipment associated with any rescue mission the helicopter may encounter.

Medical Department—Three simulated casualties were placed at the crash site with injuries simulated with rubber medical training moulages. Victims number one and two were found. After being told by an observer that there was another victim, a perimeter search was conducted. Number three was located almost immediately, behind a nearby bush.

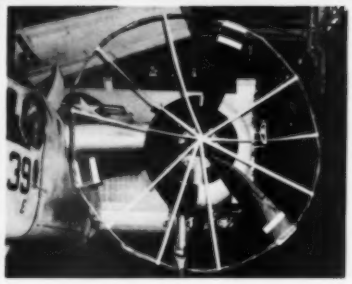
Recommend that first aid and casualty management program be revised in an attempt to give Rescue Services personnel knowledge superior to that required under the general term "Buddy-aid" (basic principals and techniques of first aid developed for field use). Also recommend that security personnel be reminded that any crash on land might possibly result in injury to people other than aircrew and of the necessity of an immediate routine perimeter search of the crash site.

The preceding discussion gives only a brief picture of the scope of the drill. Preparation was extensive. Umpiring and grading the exercise required an understanding of the objective: find out what could go wrong and don't try to sweep it under the rug. As a result, MCAS ——— discovered and corrected their pre-accident plan problems *before* it had to be used, "for real."

Finally, there was an extra benefit in the oral critique following the exercise. "The participation of the units in the discussion," said the exercise coordinator, "seemed to make for a closer knit Rescue Service Division and to create a feeling of team spirit."

Luck rarely prevents an accident: Professionalism often does.

All Pilots Read



Prop Arc Demonstration

NEW people checking into VS-27 are indelibly impressed with the full arc of the *Stoof's* prop blades by this simply constructed training aid. Full blown photos posted in hangar and ships' spaces serve as a continuing reminder of the hazards involved. Please adapt and adopt.

Takeoff Instructions

It was pointed out in the Aviation Safety Council minutes that the tower operators have been clearing aircraft to take the runway with the phrase, "After the landing traffic you are cleared to take the duty." One pilot on a night hop was cleared to take the duty with this phrase but received only the last part of it. Luckily, he saw an aircraft in the groove and stayed clear of the runway. Otherwise an accident could have occurred.

In the future, it is recomended that station operations have its tower operators use only the phrases, "You are cleared to take the duty and hold. Repeat hold." Or, "You are cleared to take the duty for takeoff.—*MAG-12 Aviation Safety Council*

GTMO Point X-Ray Moved

The establishment of Point X-ray as a check point for aircraft inbound to Guantanamo keeps all such aircraft clear of Cuban territorial waters. However, it has also created some safety problems.

Point X-ray bears 140 degrees at 11 miles from the Leeward Point tacan station, which places it right on the northern boundary of operating area 15. While this may place inbound aircraft in close proximity to ships operating in the extreme northern part of area 15, it was considered satisfactory because all shipboard firing must be toward the south.

What was not considered in locating Point X-ray was that in some firing exercises an aircraft tows a sleeve over the ship at right angles to the ship's course and that the aircraft's heading must be northerly to permit the ship to fire to the south.

With more than a mile of tow cable separating the aircraft from the sleeve it is quite possible and in a few cases has actually happened that the tow aircraft reached Point X-ray before the ships stopped firing at the sleeve.

The implications of a MATS aircraft crossing astern of an aircraft towing a mile of steel cable are too horrible to contemplate. To reduce the possibility of such an occurrence Point X-ray has been shifted two miles northwest of its present position. However, this is still a dangerous area, especially in the late afternoon when firing ships are operating in the northwest corner of area 15 so as to be close to Guantanamo Bay at the close of the day.

Keep a sharp lookout when approaching Point X-ray and give any blue and yellow S-2 aircraft in the area an extremely wide berth. —*NAS Guantanamo*

"Why is there not enough time to do it RIGHT . . .

Flight Ops at NAS Twin Cities

The primary mission of Naval Air Station, Twin Cities, is the training of reserve pilots in operational combat aircraft. The station complement of enlisted and officer personnel is keyed to this mission, as is the allowance of operating space.

Consequently, NAS Twin Cities is listed as an "official business" or "prior permission required" station in the Enroute Supplement, due to the lack of transient servicing personnel and parking space for transient aircraft.

Transient aircraft are always welcome when space permits and capabilities to service various model aircraft are available. In this regard, NAS Twin Cities has had an average of 40 transient aircraft per month over a period of several years.

NAS Twin Cities is responsible for maintaining sound and satisfactory relationships with the Metropolitan Airport Commission, which administers and operates the Minneapolis-St. Paul International Airport where it is located, and with the surrounding community which borders the field on all sides.

An increasing number of irregularities involving transient aircraft from the fleet has imposed a serious strain on the station's position in the community. For example:

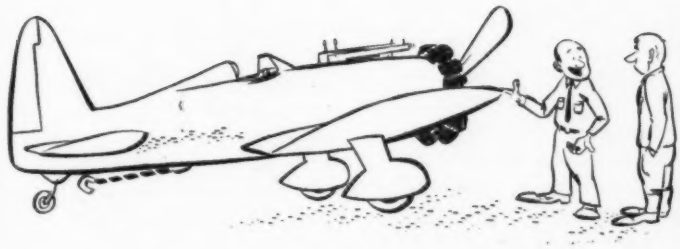
- low profile climbouts over heavily populated areas by jet aircraft with afterburners ignited.
- acrobatic demonstrations over the field at low altitude while engaged in a normal break to the downwind traffic pattern for landing.
- flying at low altitudes over surrounding communities and endangering mink and turkey farms.
- other similar incidents not expected of a professional pilot.

In the past these incidents have been reported by letter or other appropriate means, to the commanding officers of the pilots concerned. This policy will continue in the future.

Meanwhile, NAS Twin Cities requests the assistance of the fleet in curtailing such irregularities and in impressing the vital factors of safety, airmanship and confidence required upon some pilots who apparently feel that anything goes around a Naval Air Reserve Station.

Flapping Blades

It is requested that flight deck personnel involved in operations forward of spot No. 3 stand farther away from helicopters during launch and engagement. The potential hazards of flapping blades is as serious as the threat offered by spinning props. This threat must be made clear to flight deck personnel, particularly during cross-deck operations where turbulence exaggerates asymmetric flapping of main rotor blades.—*USS* INTREPID



"It might be a bit slow, but think of all the problems it would solve."

but there is enough time to do it OVER!" Headmaster

PUCKER FACTOR

I had just waved off from a night practice CCA and was headed back to marshal. At angels 10 my mental composure was rudely shaken by a fire warning light plus a muffled explosion. Immediately I turned the *Crusader* towards USS BOAT and gave the instruments a quick check. No abnormalities—just a very bright fire warning light and a dark, dark night.

A quick call to BOAT Approach gave a very abbreviated account of what had happened plus a "pull forward, I'm landing now or ASAP!" Then I lowered the seat just in case.

As radio transmissions were exchanged to establish radar contact, the engine oil/hydraulic pressure light came ON! My first thought was, "Oh hell! I'm losing my oil now!" A quick glance at the oil gage showed that it was holding a steady 43 psi. However, the PC-1 was fluctuating between 0-3500 psi. At least things still appeared to be operating normally in the J-57 department.

As I approached the ship they told me to expect a 5-minute delay. I "rogered" and put out the RAT and proceeded down the starboard side. Turning downwind, the pitch control started getting sloppy so I transmitted, "You'd better hurry with the deck—things are turning to worms fast!" I was still in a clean configuration in order to zoom and eject—if necessary.

As I turned to the final bearing, the aircraft kept rolling past the desired 30 degrees angle of bank. Full top rudder and opposite aileron were required to stop the roll. During these efforts, my intentions were to get out and swim if the roll continued through 90 degrees of bank. But the bird slowly responded and rolled back level and within 5 degrees of the final bearing! Control effectiveness was marginal although there was still enough left to get aboard.

At two miles I dirtied up. When the wing came up the nose pitched over to 25 degrees nose down, then to 20 degrees nose up (on the VGI). As the SPN-10 glide slope was approached everything was

ANYMOUSE

The purpose of Anymouse (anonymous) Reports is to help prevent or overcome dangerous situations. They are submitted by Naval and Marine Corps aviation personnel who have had hazardous or unsafe aviation experiences. As the name indicates these reports need not be signed. Forms for writing Anymouse Reports and mailing envelopes are available in readyrooms and line shacks. All reports are considered for appropriate action.

— REPORT AN INCIDENT, PREVENT AN ACCIDENT —

fairly stable again. Nearing the ramp the meatball went a little low and I applied back stick to correct. After pulling the stick all the way back and applying 15 units nose up trim, the ball finally began moving up. The nose pitched up momentarily and then fell through, causing me to lose the ball off the bottom of the Fresnel lens.

The landing that followed resulted in hook marks six inches from the rounddown and a real scared fighter pilot on the end of the No. 1 wire.

As the aircraft came to a welcome stop, a yellow shirt came out to taxi me out of the arresting gear. My thought at that moment was, "#$%¢, did they think I was holding a drill?" As I started taxiing out, paddles called "208 you are on fire!" I shut down and exited the F-8 in record time.

A post-mortem of the incident revealed two items of interest. First, the fire was caused by a fuel manifold failure. Fire had burned through the diffuser section and the PC-1 hydraulic breather lines. The cooling duct down the inside of the fuselage had carried heat and flames down to the Unit Horizontal Tail controls. About the time I landed, the fire had started burning through the fuselage at the amber formation light—two inches above a fuel cell!

The second item of interest is a post-mortem of my actions. I had enough indications in the cockpit to assume serious trouble was going on inside my machine. I had two choices.

If you want to land immediately never underestimate the power of the declared emergency. Use it wisely of course. With so much against me I think I was lucky to have made it aboard. Ejection might have been best.

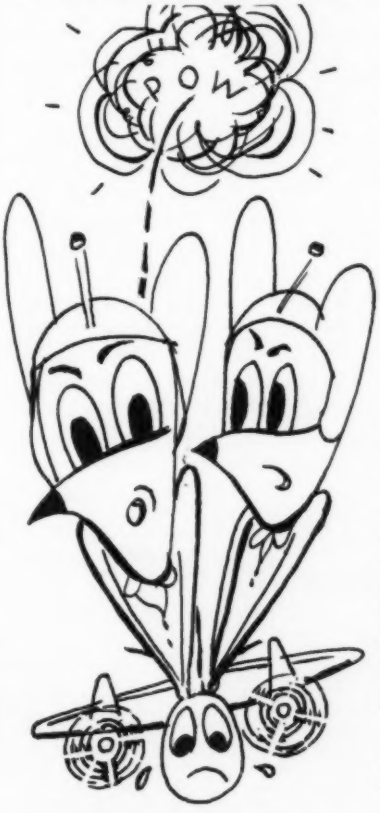
Headwork Problem

It was the student's fourth fam hop and the instructor, an ex P-2 driver having just completed his S-2 checkout, was in the right seat.

The takeoff and climbout were normal. Just after the power was reduced to climb settings and the single-engine rudder assist was OFF, a loud explosion was heard.

The *Stoof* pitched forward and right wing down. The instructor grabbed the controls, selected single engine rudder assist and attempted to stabilize the aircraft. Moderate airframe buffet was experienced and the craft failed to respond to control movements.

In a frantic effort to level the wings before hitting the ground, the instructor hacked both throttles.



This action improved controllability and the instructor was able to stop his descent at about 150 feet. Power was reapplied slowly and balanced level flight was maintained. At this time the RPM on No. 2 engine read 0 and attempts to feather it were unsuccessful.

It took some heavy coaxing and nursing but by the time they got to the downwind leg, they managed to put 500 feet between them and the ground. Although both pilots were experiencing "single-engine leg flutter," an uneventful landing was made.

Investigation showed that the No. 2 engine had suffered sudden stoppage and that the buffet was caused by the shaft attempting to halt the prop in its tracks. Fortunately, the retaining bolts on the thrust plate had sheared and the shaft spline had so twisted that the prop freewheeled. Feathering was impossible under these circumstances because all oil was lost through an opening made by the shifting of the thrust plate after its retaining bolts failed.

The lesson to be learned here is that continued high power application in this instance could have resulted in tragedy. The urge to "cob the good one" at low altitude and low airspeed, after losing one trusty fan, must be tempered by the circumstances.

The possibility of a power reduction in an engine failure situation must be considered as part of the problem. Maximum attention must be directed to controllability of the aircraft even to the extent of ditching or forced landing if lack of airspeed and altitude precludes maintaining flight.

Engine failure is a headwork problem . . . *not* just an automatic reflex reaction. . . .

Reader Questions Headmouse Answers

Have you a question? Send it to Headmouse, U. S. Naval Aviation Safety Center, Norfolk, Virginia 23511. He'll do his best to get you and other readers the answer.

Cooling Hot Brakes

Dear Headmouse:

On your safety poster (C12 GI 1163), a statement is made to the effect that dry chemical should be used as a cooling agent on hot brakes, wheels and tires.

Our Fire Chief has taken exception to this on the grounds that dry chemical is an excellent fire extinguisher but has little use as a cooling agent.

I have seen dry chemical used at other air stations successfully and have told him so. However, here at Miramar hot brakes and wheels are almost an everyday occurrence and he must have handled many more than I have seen. The Fire Chief's pickup has two self-powered fans which have been used successfully for some time.

Can you lend me some ammunition to support using dry chemical as a cooling agent?

R. M. BUCK, LCDR
SAFETY OFFICER
NAS MIRAMAR

▶ NavWeps 00-80R-14, U. S. Navy Crash and Firefighting Manual, 15 Sep 62, Para 3-40: "Tests of dry chemical indicate it will not chill on contact and will absorb heat."

Para 3-43: "Tests that were conducted on hot wheels with CO_2, foam and dry chemicals showed that the use of dry chemical was far superior because it did not set up severe stressing."

According to BuWep Inst 134-20.1, 8 Oct 1962, your Fire Chief knows what he is doing. The primary means recommended for cooling overheated wheel, brake and tire assemblies is to park the aircraft in an isolated location and allow the assembly to cool in ambient air for 45 to 60 minutes. A crosswind of forced air from a a blower or fan will assist in cooling of wheels.

The instruction also notes that if it is necessary to accelerate cooling and if application equipment and wheel and brake design permit, the cooling agent should be concentrated on the brake and not to the wheel, making direct contact with the exposed portion of the brake. A note of caution is added: Required personnel should approach overheated wheels in a fore and aft direction—never in line with the axle!

Very resp'y,

Headmouse

Wet Suits

Dear Headmouse:

The Coast Guard has discontinued use of the Mk 4 anti-exposure suit for cold water protection in favor of the skin diver's wet suit in the Alaska area. Their pilots claim that they much prefer the wet suit. I had occasion to investigate a helicopter accident in which one crewman was wearing a wet suit and the other a poopy suit and the results strongly favored the wet sult.

At the last Safety Council meeting here L was asked what the Navy thinks of the wet suit. What is the current status of the wet suit question?

P. R. BURKETT LT MC
USNS, KODIAK, ALASKA

▶ Here is the status of wet suits in Navy SAR work at this writing: BuWeps letter RAAE-223/124:RCB of 5 March 1964 authorizes interim allowance for wet suits for pilots of rescue helicopters which do not have blowers attached to the aircraft (limited to operating areas where the water temperature is 40° or above). SAR pilots flying aircraft with blowers attached can use the ventilated undergarment of the Mk-5 anti-exposure suit. OpNavInstruction 3710.7B authorizes helicopter crewmen to wear the wet suit in aircraft with or without attached blowers. Generally speaking, the wet suit concept is still under consideration but not with the type suits presently available. BuWeps is continuing its present effort to develop an anti-exposure protective garment specifically designed for the helicopter rescue mission.

Very resp'y,

Headmouse

Drag Tests

Dear Headmouse:

I have heard that the Naval Aerospace Recovery Facility is conducting tests to see if a survivor wearing a rigid seat survival kit can turn over during overland parachute drag. Do you know anything about this?

CONCERNED MOUSE

▶ You are correct. The following is quoted from a letter from NARF describing the project:

"It was suspected that while be-

'Quality is more than an inspector's stamp!'

ing dragged face down over brush and rock that the survivor may have some difficulty in holding onto, and releasing himself from the canopy. If the survivor could turn over onto his back, releasing the canopy could be achieved with less damage to the arms, face, chest and hands due to rough terrain. It was felt that the rigid seat survival kit could possibly interfere with the ability of the survivor to turn over.

"To investigate the problem, 12 land drags were conducted; 5 mph was the speed of the first drag. Drags 2 through 12 were 10 mph. It is recognized that ideal terrain conditions were utilized (level ground covered with some grass) to avoid, if possible, injury to the test subjects. However, it is considered that some insight into the problem could be obtained under these conditions.

"The time required for the subject to turn from a prone position to a supine position and then release the canopy was calculated from the movie film (taken at 50 fps) and averaged 3.5 seconds. During the experiment it was discovered that when holding onto the parachute risers it is difficult to achieve the supine position. The survivor is therefore advised to let go of the risers, hold his arms over his head, and use them to effect the roll. Even with the Mk-3C life preserver inflated, rolling over to the supine position was no problem.

"In conclusion, it is the opinion of this Facility that the rigid seat survival kit does not significantly interfere with the ability of a survivor to roll from a prone to a supine position."

Very resp'y,

Headmouse

P-3A Fire Extinguisher Systems

Dear Headmouse:

This concerns the condition of the P-3A engine fire extinguishing systems in relation to aircraft readiness status.

The P-3A is equipped with two independent electrically controlled HRD (high rate discharge) fire extinguishing systems. Each system has two interconnected containers of bromotrifluoromethane (CF Br in liquid form). One system is for engines 1 and 2, the other for engines 3 and 4. Two discharges are available from each system; 1 for each engine or 2 for the same engine. However, the port and starboard systems are not interconnected.

The question: Would an aircraft be in UP status, ready for flight if all four containers were not fully charged?

QUALITY CONTROL MOUSE

▶ No. NavWeps 01-75PAA-6-1, Daily Maintenance Requirement Card states, "MRCs contain the minimum daily requirements. These requirements establish what work is to be done and what conditions are to be sought. Clearances, pressures, tolerances . . . are present where pertinent."

In the case of fire extinguishers, MRC 12.1 states that fire extinguisher cylinders (all four) will be checked for correct pressure, approximately 600 psi at 70°F. All four pressure gages must be within 60 psi of each other. MRCs 8 and 9 also require that portable fire extinguishers be inspected for intact seal and secure stowage.

If a container is discharged it should be recharged or replaced. If for some reason this is impossible, a flight safety AmpFUR should be submitted noting this material deficiency.

Overriding such a case is possible under NATOPS OpNavInst P3710. 7B, Para. 546, where mission or urgency of a flight so dictates in the opinion of proper authority.

Very resp'y,

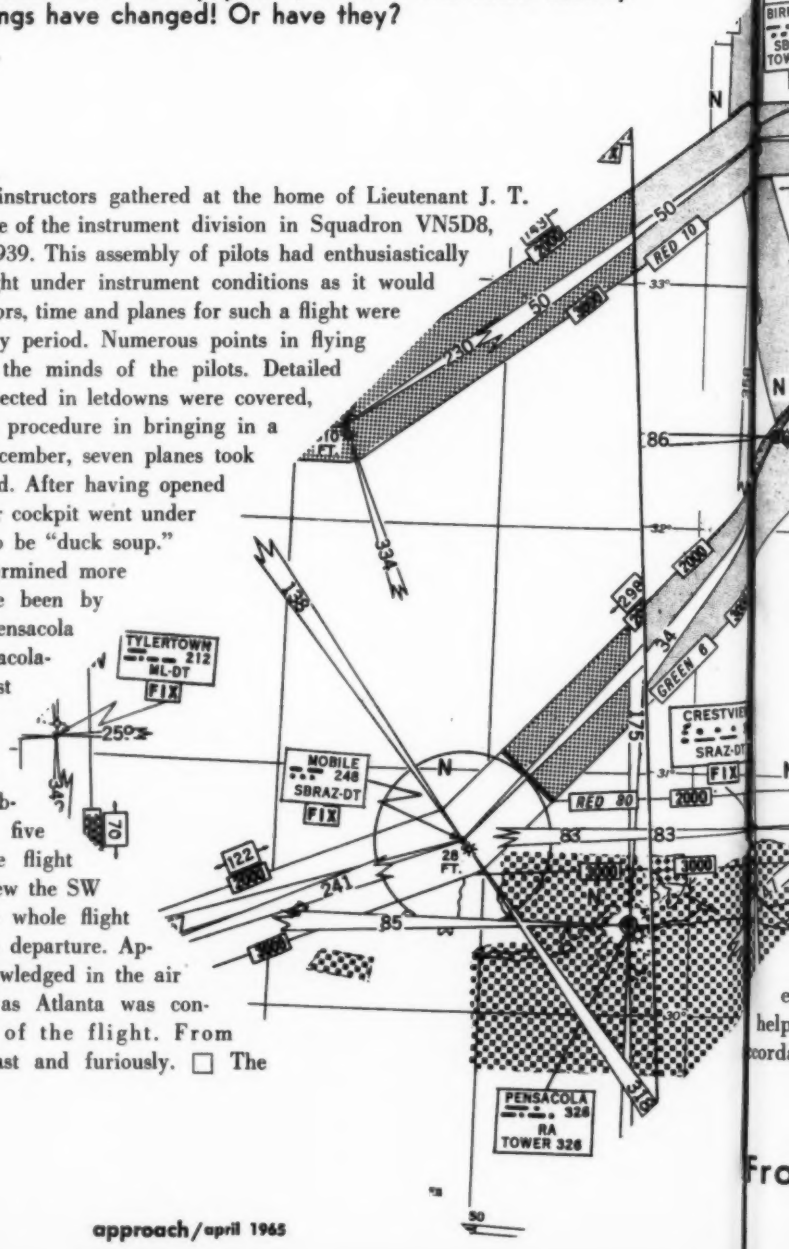
Headmouse

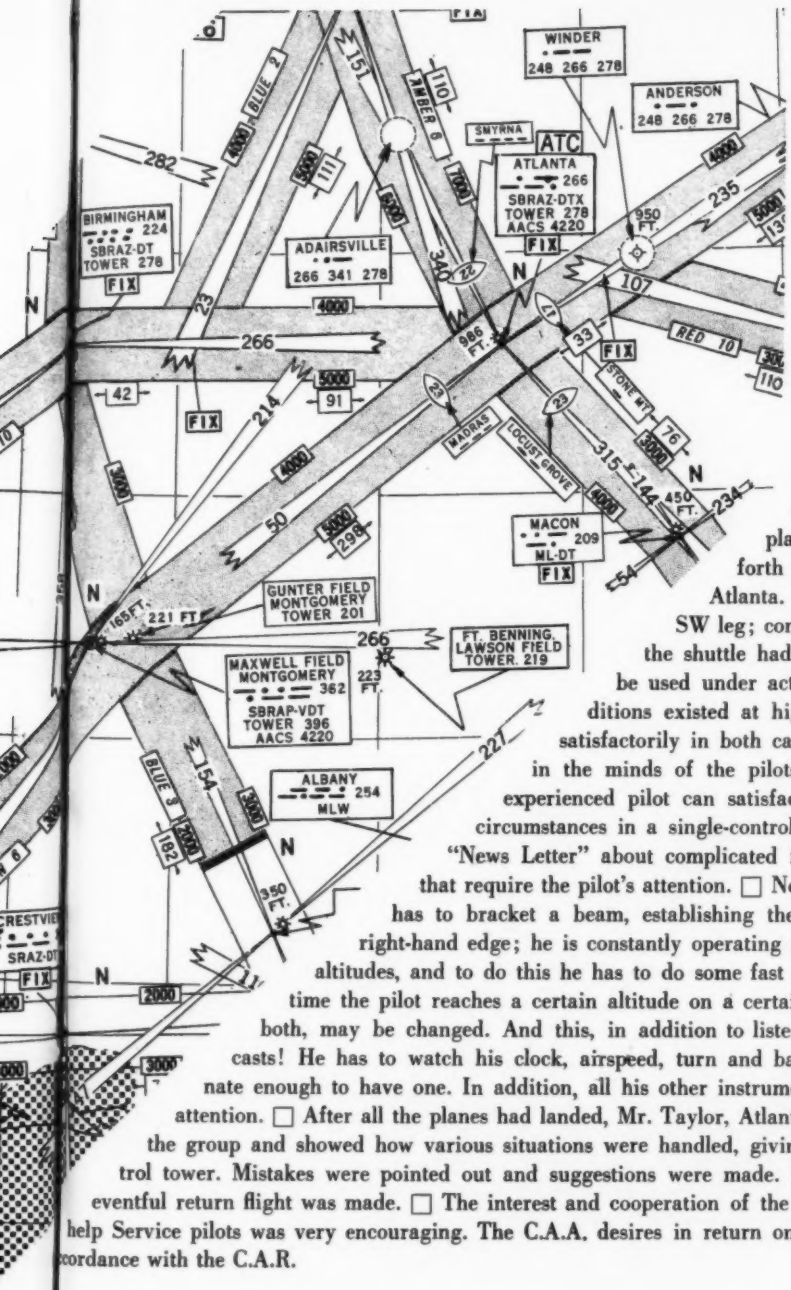
B. C.

Needle, Ball and Ripcord

For a sense of adventure come back to an airways flight of 25 years ago. Chuckle over the equipment, smile at the radio facility chart. How things have changed! Or have they?

Pensacola, Florida—A group of instructors gathered at the home of Lieutenant J. T. Workman, USNR, Officer-in-Charge of the instrument division in Squadron VN5D8, on the evening of 26 December 1939. This assembly of pilots had enthusiastically expressed a desire to attempt flight under instrument conditions as it would normally be made. ☐ The instructors, time and planes for such a flight were made available during the holiday period. Numerous points in flying the airlanes were cleared up in the minds of the pilots. Detailed instructions in what might be expected in letdowns were covered, particular attention being paid to procedure in bringing in a "stack-up." ☐ At 0900 on 27 December, seven planes took off and rendezvoused over the field. After having opened up the formation, pilots in the rear cockpit went under the hood. Navigation was found to be "duck soup." Ground speed and fixes were determined more accurately than they would have been by contact. ☐ The flight took the Pensacola beam to the intersection of the Pensacola-Mobile beam, establishing the first fix. Then taking the NE leg of the Mobile beam out until the weak Montgomery beam could be picked up, another fix was established over this station. About five minutes out of Montgomery, the flight shifted to the Atlanta beam and flew the SW leg in. ☐ A flight plan for the whole flight had been sent to Atlanta prior to departure. Approval of the plan had been acknowledged in the air through Mobile Radio. As soon as Atlanta was contacted, that station took charge of the flight. From this stage on, events occurred fast and furiously. ☐ The





ceiling was a little over 3500 feet at Atlanta. Consequently, to avoid flying under actual instrument conditions, Atlanta stacked the first four planes over the station. The remaining three planes were directed to shuttle back and forth at assigned altitudes five minutes from Atlanta. At this time there is no marker on the SW leg; consequently, a dead-reckoning position for the shuttle had to be taken. This same method would be used under actual instrument conditions if icing conditions existed at higher altitudes. ☐ The stack developed satisfactorily in both cases. However, considerable doubt exists in the minds of the pilots in the flight as to whether even an experienced pilot can satisfactorily handle a letdown under similar circumstances in a single-control plane. ☐ Much has been said in the "News Letter" about complicated flying machines and the many gadgets that require the pilot's attention. ☐ Now, in addition, the pilot on instruments has to bracket a beam, establishing the course he has to fly to stay on the right-hand edge; he is constantly operating the radio, giving positions, courses and altitudes, and to do this he has to do some fast and fancy navigating. ☐ Just about the time the pilot reaches a certain altitude on a certain leg, either the altitude or the leg, or both, may be changed. And this, in addition to listening through the same beam for broadcasts! He has to watch his clock, airspeed, turn and bank or artificial horizon, if he is fortunate enough to have one. In addition, all his other instruments still require the normal amount of attention. ☐ After all the planes had landed, Mr. Taylor, Atlanta C.A.A. representative, took charge of the group and showed how various situations were handled, giving practical demonstrations in the control tower. Mistakes were pointed out and suggestions were made. ☐ After a good, warm lunch, an uneventful return flight was made. ☐ The interest and cooperation of the C.A.A. group and their willingness to help Service pilots was very encouraging. The C.A.A. desires in return only that naval pilots fly the airways in accordance with the C.A.R.

From Bureau of Aeronautics NEWS LETTER 1 February 1940


After an explosion in flight and flameout, the pilot of an A-4 pro
COOL TUBULE

A-4 broadcast his intentions and ejected at 700 feet and 120 knots.

As the aircraft got slower, the nose pitched forward and ...

...I seemed to have stopped flying. I reached for the face curtain, positioned my head in the headrest,

straightened my back and ejected. The time span between the explosion and the point that the aircraft seemed to stop flying I'd estimate was about 10 seconds. I did not have a chance to read the gages before I ejected. There was no doubt in my mind that the engine was flamed out, that I was slowing rapidly and that I had a minimum of time to eject. I estimate that I left the aircraft as it passed through 700 feet, 120 knots with the beginning of a healthy sink rate.

"The ejection was smooth in all respects with no 'slap' or jolt. I was aware of a bright flash and a smooth acceleration. I seemed to arc to the left in a horizontal trajectory and I saw the aircraft hit the water before my parachute opened. Since I saw the aircraft make a considerable splash, this told me that I was fairly close to the water. I did not see any flame emitting from the aircraft either prior to, or as it struck the water. I did not feel the seat separation. However, the parachute seemed to open with a sizable shock. I felt like a marionette on the end of a string.

"I released the right side of my oxygen mask and inflated my Mk-3C during the descent. I started to reach for my left seat pan rocket jet fitting but changed my mind. Since I knew that I would soon be in the water, I was more concerned at the moment with releasing the parachute. I did not want to enter the water while fumbling with my seat pan with the parachute still attached. I reached up on the risers for my parachute rocket jet fittings, remembering that they would be higher than usual and just as I did, my feet hit the water. I released the rocket jet fittings simultaneously and had no trouble at all in getting rid of the parachute. I had not been wearing my flight gloves when I ejected. I estimate that the parachute descent only took 10 to 15 seconds before I hit the water.

"I went underwater only briefly, and the Mk-3C brought me quickly to the surface. The night was very black, and I turned on my mercury battery survival light immediately.

"Next I released my left seat pan rocket jet fitting, and, with the lower right fitting retaining the seat pan, I swung the pan around to locate the yellow lanyard leading to the life raft. I had considerable difficulty in locating the survival kit lanyard because it appeared fouled. Normally the metal end of the lanyard which is to be clipped on to the pilot's torso harness is readily visible. However, in the blackness, the seat pan itself was difficult to see even with the mercury battery light on. I finally located the yellow lanyard using my red flashlight which I had retained on my leg holder during the ejection. The lanyard appeared in the blackness to be extending from the seat pan as a loop with both ends of the lanyard out of sight. Finally by yanking on the lanyard, I was able to locate the metal clip and attach it to my torso harness helicopter rescue ring. Even by following the lanyard itself to the seat pan, it was considerably difficult to locate the toggle for the life raft.

"I saw the masthead lights of a destroyer in the distance and temporarily forgot about the life raft in order to light a Mk 13 Mod 0 day-night distress signal. I intended to use the distress signal to initially direct the ship toward me. While the flare was illuminated I was especially concerned with keeping it downwind from me so that any hot particles falling from it would drift away from my life preserver. The ship seemed to be headed directly toward me, even though I occasionally lost sight of her when I was in a trough. The swells appeared to be about four or five feet high.

"My flight leader was circling around me and had been giving directions to the rescue destroyer and vectoring it towards me. These airborne directions plus the night distress signals were the most effective factors in guiding the rescue DDG towards me according to the ship's skipper.

"I had been carrying the Mk-79 survival flare in addition to the .38 caliber pistol and shot two Mk-79 flares off in rapid succession. The ship was approaching me rapidly it seemed and I devoted a few more minutes to trying to inflate my life raft. The seat pan/survival pack left rocket jet fittings had been released in the water instead of in the air as is normally done and this may have added to the difficulty of freeing the lanyard. I was not panicky when trying to get to the life raft toggle, just irritated that it was consuming so much time.

"As the ship got closer, its searchlights were still scanning and I felt that they didn't have me visually so I left the life raft again and fired several Mk-79 flares and the other day-night distress signal from my Mk-3C. I also used my .38 caliber pistol and fired four tracers. The distress signal homed the destroyer in on me. According to the crew the tracers pinpointed me. The second night Mk-13 Mod 0 distress signal which I fired was more difficult to actuate than the first. I first tried to pull the cover straight off. I was unable to actuate it. Remembering my experiences before in practice firing these signals, I thought a second and then twisted the cap. This readily freed it.

"The destroyer had searchlights focused on me, and I could hear her skipper giving engine orders over the 1MC. The destroyer personnel threw several kapok heaving lines to me. Finally I managed to grab one. They pulled me to the side of the ship and lowered a horse collar which I slipped into. Using a block and tackle, they hauled me aboard.

"In talking over the rescue with the crew of the destroyer, I learned several important points:

- The reflective tape on my helmet showed up well in the searchlights. This speaks well for leaving your helmet on.
- The Mk-13 Mod O day-night distress signals were definitely the most effective signals that I carried, simply because they were the brightest. The commanding officer of the ship commented that the second distress signal firmly established my position. This emphasized that the Mk 13, Mod 0 signals should be spaced; they should not be lit off one after the other but used as the situation dictates.
- The Mk-79 pencil flare gun was brighter than the tracers; however, the Mk-79 charge does not illuminate until close to the top of its trajectory. Although the .38 caliber tracers were not as bright, they illuminated sooner than the Mk-79 flare when fired and therefore helped the destroyer crew find the source of the light—the pilot's position. However, the Mk-79 is an outstanding supplement to the .38 caliber pistol especially when you consider its compactness and lightness.
- The C.I.C. watch on the ship reported that they did not hear my PRC-49.

"My experience as squadron aviation equipment officer for eight months helped me considerably. Last January I had evaluated the Mk-79 pencil flare gun in the outdoor swimming pool at the station at night, in 18° weather. This evaluation thoroughly familiarized me with the use of the Mk-79 Mod 0 flare. One point in particular impressed me that night in the pool, and that was how difficult it can be in the darkness to find the Mk-13 Mod 0, day-night distress signals that are carried on the Mk-3C. When the life preserver is inflated, the signals are tucked under its bulge. The experience of locating those signals in the water and in unfavorable weather at night really helped me in this actual situation.

"Although I had difficulty in finding the life raft lanyard, I know that I would have eventually gotten the life raft inflated if I had been forced to remain in the water longer. Two factors contributed to my trouble. First, the night was pitch black and it was extremely difficult to see even the seat pan itself. Second, I think that releasing the seat pan in the water can cause it or its components to foul, since it is floating and can twist and float in nearly any attitude. I recommend applying reflective tape to the lanyard itself in a candy stripe pattern to aid in seeing it at night. Also recommend applying this tape to the toggle for the life raft. (*A source of light would be needed for the tape to be effective.—Ed.*)

"In thinking about the destroyer rescue, I feel that her skipper's use of the 1MC to give engine orders and direct the searchlights was outstanding. First of all, it told me that they definitely had me in sight. Secondly, it was, to say the least, psychologically reassuring.

"I felt that my survival training, especially the squadron's dry run ejection drill in an unarmed cockpit, was invaluable. And, in addition, I felt that the prompt and decisive action by my flight leader in spotting my signals and directing the rescue destroyer toward me saved a great deal of time and speeded my rescue considerably."

"The pilot's knowledge of his survival equipment is considered outstanding," the commander of the Attack Carrier Air Wing comments. "Too often pilots do not heed the many instructions and warnings on the absolute necessity of knowing your equipment and procedures prior to the beginning of the problem. The commanding officer of the rescue destroyer described this pilot as 'a cool turtle who knew how to use his survival equipment.' His knowledge aided in his rapid recovery. He is to be commended."

APPROACH is distributed on the basis of one copy per 10 or so people in your unit. Pass this copy along to another shipmate. *The accident you prevent may be his!*

'Tired? Who's tired?'

When an F-8B with UHF receiver failure in the final portion of its second night landing approach struck the carrier ramp and exploded, the pilot ejected. Fatigue from the tempo of operations was considered a definite contributing factor in this accident.

The pilot's main parachute deployed above the flight deck alongside the ship's island structure, and seat separation took place. About the time the wreckage of the aircraft was clearing the port side of the ship, the pilot's parachute reached full deployment, and he started his initial downswing.

Immediately afterward, in the glow of the fire, observers saw the main parachute settle to the flight deck. The chute snagged on a light fixture with the shroudlines draped over the catwalk railing. The flight deck officer and two assistants quickly collapsed the chute. At this point, the shroudlines took the full support of the pilot's weight and began to slip. The suspended pilot was hoisted aboard by the shroudlines—an ejectee at sea who never even got his feet wet!

Afterwards the pilot recalled how things were during the seconds before ejection.

"On impact, I felt something hit my legs and then a tremendous jolt. Almost simultaneously I saw a flash of light in my peripheral vision. I realized that the aircraft had exploded.

"I instantly reached for the face curtain. The seat ejected and I knew I was clear. I could feel myself tumbling through the air. I didn't really believe that the chute would open fully and was anticipating hitting the water. About the time I thought I would hit, there was a tremendous jerk and I thought my chute had opened.

"I oscillated four or five times. Then, again in my peripheral vision, I saw the ship and thought I was going to hit alongside it. A few seconds later I realized that my chute was hung up on the flight deck.

I looked up and saw several people trying to pull me aboard."

To the tape recording of his statement made an hour after the accident the pilot added, "I had felt somewhat tired prior to the flight. I, perhaps, had not had adequate rest but this was due to our heavy operational commitments. I had been asked several times by both the operations officer and the commanding officer as to my physical condition and I must take full responsibility in the decision to fly."

Here we have it—the typical pilot fatigue dilemma aboard ship. The squadron as well as the Air Group had been under a large amount of strain—an alert status, the ship's ORI and only 12 pilots to fly the 20 sorties scheduled for it.

The pilot in question had had only nine hours' sleep in the two preceding nights. This breaks down to five hours the first night and four hours in the readyroom during standby the second night. During the day of the accident, he manned his aircraft four times and flew two hops (including the accident hop) for a total of 3.3 hours. He was a spare for the other two hops. During the day he managed to snatch a 45-minute nap. He remembers feeling tired prior to the last hop but, as he states, denied it when questioned at the time. Looking back on the flight, he says he felt behind the aircraft . . . a bit slow in making corrections.

Here's the investigating flight surgeon's thinking on the problem: "Certainly most of the pilots in the squadron as well as those in the rest of the Air Group had suffered from a lack of sleep. The question then is raised concerning what then would have been the proper course of action for the squadron to take in preventing this accident. Could the squadron have come out and grounded most of the pilots who had suffered from lack of sleep? Perhaps a desirable course in peacetime but not very practical during an alert status or in wartime. I believe that it must be realized that there will be times when pilots as well as others in the Armed Forces will have to perform when they are fatigued.

"With the present medical aids available," the flight surgeon continues on a somewhat different tack, "there is no real reliable method of determining which tired pilots really will constitute a liability. The only means we have of determining this is the pilot himself. He, in the end, must assume this responsibility for voluntarily grounding himself."

The squadron CO is well aware of the difficulty in telling who's tired: "Except in pronounced cases," he says, "there is considerable difficulty in determining a pilot's state of fatigue by visual observation.

"Since fatigue factors affect individuals differently," the CO points out, "this command has emphasized the importance of the individual reporting when his degree of fatigue reaches a level where performance could be affected. In this particular case, the pilot was directly questioned prior to the flight regarding his readiness for the flight. This has been standard practice in this command in cases where conditions indicate a chance of physical impairment."

(*Most of the squadron pilots, during the day and evening of operations, had been questioned concerning their fatigue. As a result of this, several changes had been made in pilot assignments.—AAR*)

"A special effort is made to watch the squadron tigers," the CO continues. "The pilot in this instance indicated that he was ready for the flight in which the accident occurred. The tiger attitude of this young aviator may have overcome sound reasoning in his decision to make the flight. The fairly heavy tempo of operations preceding this accident had been conducive to producing fatigue factors in all squadron pilots. However, spare pilots were available and ready at the time this flight was launched."

A number of elements combined with the tired pilot to produce this accident. Without a receiver, the pilot was at a definite disadvantage, particularly in night flying aboard the carrier. (The pilot controlled his own waveoff pattern, arriving in an acceptable starting position for the second landing approach.) Worse than this lack of a functioning receiver, the flight surgeon thinks, was the fact that the LSO was not aware that the pilot was experiencing receiver difficulties. The pilot had transmitted "in the blind" on several occasions. Both PriFly and CATC Center were informed of the receiver failure prior to the second approach. The senior LSO on the platform wearing the 20JS circuit phones was not informed of the receiver failure by the 20JS CCA talker. The LSO talker on the 6JG circuit was not informed by the PriFly 6JG talker of the receiver malfunction. Had the LSO known this, the flight surgeon theorizes, the power calls initially would have been with the lights and the LSO would have waved the pilot off at a greater distance from the ship.

Among the flight surgeon's recommendations were:

- That pilots be continually reminded of the dangers of fatigue and flying.
- That all squadrons emphasize to the junior aviators in particular that aborting a hop for fatigue, minor ailments, etc., is far preferable to taking a chance on fatal results.

With fuel nearly gone ejection was ordered and the pilot had to depend on a

NIGHT RESCUE

After boltering six times on a night hop, the F-3B pilot was told to ascend to 2500 feet downwind of the carrier where he would refuel from a tanker. Although hookup was established, fuel transfer was unsuccessful and he was ordered to climb to 10,000 feet and eject.

"The ejection seemed normal and the chute deployed immediately. My time during the descent was spent preparing myself for the water entry. Because of a bruised left elbow, I chose to release the lower right rocket fitting rather than the left to make it easier for me to get my raft lanyard out." (*The pilot probably struck some object on the left side of the cockpit on ejection.—Ed.*) "I swung the seat pack around and up into my lap, pulled the D-ring, then secured the lanyard to the helo lift ring. I dropped the package and the raft pulled out of the container. . . With plenty of time remaining, I hoisted the raft back up and inflated it. This caused the raft to float above my head. The sea anchor began whipping around and became entangled in the risers.

"The next few minutes were spent untangling the sea anchor while I held the raft between my legs. Once the sea anchor was free, I felt something slapping me in the face. It was the drogue chute. I cut it off with the survival knife and put the knife back into its sheath and secured it. I was free and clear of all the lines before impact with the water. My helmet, mask and all survival equipment stayed with me during the ejection sequence.

"After I got stabilized, I threw my oxygen mask away. Upon impact, I released both upper rocket jet fittings and was clear of the chute. However, the raft's sea anchor was entangled in the parachute's shroudlines and the billowing chute pulled me about 30 feet before I could free the sea anchor. The chute continued to blow downwind about 200 feet before it collapsed. I had been hanging on to the side of the raft to stay afloat. At this time, I popped both CO_2 cartridges in my Mk-3C life preserver. Both worked properly.

"A light wind was blowing me into the partially submerged parachute. I attempted to swim crosswind and tow the raft before I got blown over the parachute and entangled in the shroudlines.

"I managed to get into the raft with very little

difficulty. After I was seated in the raft in a half-reclining position, I pulled all my survival gear and the sea anchor into the raft and floated over the top of the parachute. At this time I became sick and vomited heavily into the water.

"My torso harness flashlight which I had turned on during the parachute descent was shining brilliantly. The sea state was good—the max wave height was about three feet. About four miles away I could see the destroyer, and I took my .38 cal. revolver out and fired two tracers in its direction. Then seeing an aircraft heading toward me, I fired two tracers over my head. As the aircraft passed overhead, I waved my torso harness survival light at him and he jazzed the engine. I assumed that he had me in sight. The aircraft continued to make passes over me and I could tell that the destroyer was coming my way.

"I then took a night distress signal from my life preserver and lit it off. The destroyer blinked a signal light at me and continued inbound. When the destroyer was an estimated half-mile away, I lit the other distress signal from my Mk-3C. At this time the destroyer put a searchlight on me and came up alongside my raft. A horsecollar was thrown over. I slipped it under my arms and was hoisted aboard in short order. I would estimate that I had been in the water for no more than 25-30 minutes."

Post-accident investigation, the squadron survival officer states, revealed that the pilot was not chilled after entering the water and once situated in the raft was comfortable and warm. No anti-exposure suit was worn or required by water and air temperatures at briefing time. The pilot's flight boots were cut on the tops of the metal toes. The safety toes probably prevented serious injuries to his feet. His hard hat visor was chipped but there was no other apparent damage to his equipment. The AN/PRC 49 radio operated during the descent, ceased transmitting when the pilot entered the water, then renewed transmitting when it was recovered on board the destroyer. Throughout the ejection sequence, all items of survival equipment proved completely effective, the survival officer concludes.

Flight Surgeon's Report

"IMPROPER wearing of personal protective equipment or the failure to wear this equipment resulted in significant injury to the crew of the SP-2H." (*Hard landing followed by fire.—Ed.*)

"Rolled-up sleeves contributed to burns on the forearms of four crewmembers. Fortunately only one of these individuals sustained serious injury.

"Not one individual in the crew was wearing flying gloves. Eight of the 10 crewmembers received hand burns of varying degree. One of these individuals will require skin grafting on his hands. Two others will not have full use of their hands for months to come. Two more are just recovering use of their hands at this report writing.

"One aircrewman wore no undershirt under his flight suit. When the flight suit was torn in the accident, he received a severe and painful burn on his exposed skin.

"Only one aircrewman failed to wear a protective helmet. His only serious burns were sustained on his ears, scalp and upper neck.

"While knives, PSK-2 survival kits, life jackets and seat belts were not essential to the crewmembers' survival in this accident situation, it is indeed fortunate for them that they were not. Only five had their seat belts fastened. There were but seven knives among the 10 men and then three were lost in the accident. Two knives were improperly worn and lost in exiting the aircraft, one knife was left adrift in the aircraft. There were only three and a half PSK-2 survival kits carried on the flight.

"For the most part the crewmembers were all experienced and all were aware of the necessity of the personal protective equipment they were issued. This squadron had not had an accident in three years and their last accident resulted in no injuries. The sister SP-2H squadron at this facility also has an outstanding safety record. I can only attribute the complacency of this crew to these facts. However, the fact that one young officer crewmember had only a flight suit and a pair of boondockers as his complete flying outfit suggests something beyond complacency.

"Panic and subsequent impru-

dent jumping from the burning aircraft resulted in serious and unnecessary injury. Had not two of the seven crewmembers located in the forward compartment had the presence of mind to lower themselves to the ground rather than jump, I would have been very hesitant to draw this conclusion. It seems extremely pretentious to criticize others' reactions to a flaming aircraft interior, particularly when you have never faced a danger so acute yourself. However, two men actually recall starting to leap to the runway and then consciously recalling reading about previous accidents where this resulted in injury. Of those who did jump, one sustained a spinal fracture, another an ankle fracture, one a severely sprained ankle, and still another a contused heel. Perhaps had the dangers of an indiscriminate leap from a disabled aircraft been emphasized during these latter individuals' training, fewer injuries would have occurred.

"• It is recommended that the survival training programs be reemphasized with particular regard for the importance of proper personal protective gear, its wear and use. Outstanding safety should not breed complacency.

"• It is recommended that the dangers of indiscriminate jumping from downed, disabled aircraft be reemphasized throughout the fleet. It should be made clear that getting out of aircraft safely is second only in importance to getting out at all."

Burns

WHEN exiting onto the port wing (where an estimated 55 gallons of fuel was burning from a ruptured tank), one of the survivors of the A-1E crash sustained first and second degree burns of the exposed area of his face, his left hand and right arm. He was wearing a helmet with no visor and had removed his gloves prior to landing. The burn of his arm occurred through an intact flight suit which was not burned.—*From an MOR.*

Cartridge Missing

ONE of the survivors of an aircraft accident, on inventorying his gear, discovered he obviously had not preflighted his Mk-2 life vest. The left CO_2 cartridge container cap was screwed down tight but the container was empty.

Preflight your life vest *before every flight.*

Meals—Not Snacks

TO THOSE pilots who may be inclined to "grab snacks" at odd hours rather than take the time to enjoy proper food, particularly when on trips, the following admonitions of an airline doctor should be given serious consideration.

"It may strike you as a bit unusual that eating and safety are positively related when much has been said on the negative side about eating and being overweight. The facts are that while overeating may be a threat to health on a long-term basis, undereating can, at times, become an immediate threat to you and the lives of your crew members.

"Your body, just like your aircraft, runs smoothly when the tank is fueled, and it burns about 250 calories per hour under a moderate workload. Your main fuel tank lasts about four and a half hours after a good meal, and when it begins to run dry the reserves are called upon. Sugar is released from the liver, your body's reserve tank, and this reserve tank may last another three or four hours.

"If you are already operating on your reserves and an emergency arises when your body needs a sudden burst of energy, the necessary reserve may not be there.

"Even under normal flying conditions, the reserves eventually can be depleted and your body rebels against burning up good muscle tissue just because you have not taken time to eat. As your blood sugar level drops, your brain cells are starved and you become fatigued and irritable. Coordination drops off, attention span shortens, and procedural sequences may be inverted or portions dropped out altogether.

"The obvious solution to this flying safety hazard is, as always, prevention. To remain your alert best, give your body the fuel it needs in the form of well-balanced, *regular* meals."—*USAF Combat Crew*

Poopy Suit Pocket

A PILOT in a recent ditching was not carrying his survival sheath knife and the controller's was inaccessible. In both instances, the omission was due to wearing the Mk-5 anti-exposure suit. It is recommended that a suitable zipper-type external pocket be installed on all new anti-exposure suits presently in stock or in use. It is further recommended that this pocket be located on the outside of the right leg above the knee.—*From an AAR.*

(BuWeps is requesting that the Naval Aerospace Recovery Facility, El Centro, attach pockets to the anti-exposure suit for evaluation during parachute opening shock conditions to determine if the sudden deceleration forces on the sheath knife will or will not tear the anti-exposure suit. —Ed.)

84 MAINTENANCE GOOFS

"When I'm right, nobody seems to remember it—
When I'm wrong, nobody ever seems to forget it."
—Anon

Some of the feedback received to date indicates there are those who feel that publishing our mistakes is in effect making maintenance types look like a bunch of clods. This, they say, is because thousands upon thousands of maintenance functions and line services go on day and night, week on week and month on month without a mishap and without a word of praise.

Nothing could be further from the truth—there's an awful lot in the meaning of the statistics, without really saying "Atta Boy!" The fact that your airplane was mission-ready, come what may, is enough to say, "You've done your job well, mate." And don't think your boss, the skipper, doesn't appreciate it. Everybody up and down the line appreciates it. There's that good feeling that comes with knowing

we've done our best so that others can do their best. After all, isn't this what we're supposed to do? Yes, these achievements are recognized but we just don't dwell on them because we know that our aim is *perfection.*

We know we can't have perfection until we eliminate our mistakes. How are we going to know where we're going unless we know where we've been. If we stumbled, where did we stumble? Why? Let's take a look at what happened the past quarter (first quarter of fiscal '65). We'll know what happened, to whom it happened, and what we can do to avoid letting it happen again.

There were 84 maintenance goofs. The AD rating committed 9 goofs, AMs 22, ATs 4, AEs 3, AOs 15, plane captains 13, other personnel 18 (see Chart I).

	Rate							
Aircraft	AD	AM	AT	AE	AO	PC	Other	Total
C-130	1							1
H-16		1						1
F-1						1		1
A-1		1			1	1		3
A-3		2						2
A-4		1	2		9	2	5	19
A-5						1	1	2
A-6								
F-4	1			1	2	1	1	6
F-8	1	2				2	1	6
F-9		1						1
F-10						1		1
F-11		1						1
T-1							2	2
T-33		2						2
H-3						2	1	3
H-34		2		1		1	4	8
H-37	1							1
P-2		1	1					2
P-3	2	1					1	4
P-5			1		1		1	3
S-2C/1		3			2	1		6
C-117		1						1
C-121	2	2		1				5
E-1/E-2		1					1	2
C-54	1							1
Total	9	22	4	3	15	13	18	84

Chart I

Personnel injuries involved 1 moderate and 3 minor. Dollar losses totalled $863,040. Of this amount, 1 Alpha damaged airplane accounted for $613,000 in one fell swoop. The story on this one appears on the next page. See Chart II.

Injury	Cost	Aircraft
A	613,000	1
B	0	0
C	40,000	1
D	124,400	10
E	85,640	44
Total	863,040	
Average Cost Per Aircraft	$10,274.29	
Personnel Injuries	1—Moderate	
	3—Minor	

Chart II

Briefs of the errors which follow indicate the majority are items which are generally left for the last phase of a maintenance or servicing function. As a consequence these were neglected because of haste and perhaps seemingly unimportant. A major step then, in an effort to reduce this type of maintenance error would be to put more emphasis on attention to detail. Remember, *to hurry means to do it right the first time.*

Fire damage caused by burning fuel underneath the aircraft resulted in striking the T-1A.

Strike One!

An effort to replace a 25-cent light bulb in the aircraft's UHF control box resulted in Alpha (strike) damage amounting to a $613,000 loss.

Cause of this accident was attributed to lack of knowledge on the part of the two technicians as to the functions and location of the Master Ignition Switch or of the danger of moving the throttle with electrical power ON.

Two AT2s were working on a T-1A in the hangar for Calendar Inspection. The first technician was in the cockpit while the other stood on the steps leaning into the cockpit assisting. In order to replace the defective light bulb, the second AT moved the throttle from OFF to just past IDLE. The two electrical fuel boost pumps in the wings were supplying fuel to the fuel control and fuel manifold and in turn, drained overboard through the fuel manifold drip valve.

Neither technician was aware of any fuel flow until a passerby informed them fuel was being pumped overboard. The second AT returned the throttle to OFF and in doing so moved the throttle outboard to clear the IDLE detent inadvertently bumping the ignition switch.

Master Ignition Switch was ON and ignition was therefore placed into operation. The 120-second time delay provided ignition for two minutes even though the throttle was OFF. During this period fuel in the burn cans ignited and a flash fire ignited the fuel which had drained overboard.

Electrical power to the aircraft was secured while observers in the hangar turned in a fire alarm and proceeded to fight the fire with several CO_2 extinguishers. Prompt arrival of the fire and crash crew led to prompt extinguishment of the fire. The aircraft was then removed from the hangar and isolated as a safety precaution.

Inspection revealed extensive damage to the underside of the aircraft due to flames and heat (see photo). Large sections of the lower fuselage were buckled from heat generated by the burning fuel underneath the aircraft. There was no damage to other aircraft, the hangar or other equipment. Neither of the technicians was injured.

Maintenance supervisory personnel factor was involved in that the two ATs had been assigned to work alone on the aircraft although neither had been properly checked out in the precautions concerned. Among its recommendations, the accident board noted:

- That all shop supervisors closely monitor the performance of their men and insure that experienced people are assigned to work with men who are unfamiliar with the particular aircraft or piece of equipment being worked on.
- That all maintenance personnel be briefed not to accept jobs they are not qualified to perform without a checkout and to get qualified assistance whenever encountering unfamiliar problems.
- That all maintenance personnel be rebriefed to operate only those cockpit controls they are familiar with and have been instructed to operate.

Maintenance Error
1st Quarter 1965

AD

F-4	Incorrect engine installation caused bell-mouth damage.
F-8	Overtorque of afterburner sensing line.
H-37	A cargo strap was sucked into the fan damaging the blades.
P-3	Improper assembly of air turbine engine starter.
P-3	Propeller improperly serviced.
C-121	No. 1 flame shield not properly secured.
C-121	The aircraft blew a loading platform into a parked P-2 causing damage to the propeller.
C-54	Left upper cowling on no. 4 engine separated from the aircraft.
C-130	Improper securing of engine fairing.

AM

A-1	A wire brush was left in the wingfold.
A-3	Emergency escape chute door time delay cylinder sear pull cable was not connected.
A-3	Failure to install seat mount bolts.
A-4	Improperly serviced landing gear strut.
F-8	Two attachment bolts were left out of the starboard ventral fin.
F-9	Improper seat installation procedures.
F-9	The wheel retaining nut strip clip was not passed through the nut
F-11	Speed brake dump valve line was not properly secured.
T-33	Excessive air pressure applied to bleeder filler caused it to explode.
T-33	Unqualified man caused canopy to jettison.
H-34	Improperly secured inspection panel separated from the aircraft.
H-34	Wind rotated the tail rotor blades striking the fuselage; the brake was not locked.
H-46	*Murphy's Law*—Cross-connected hydraulic lines.
S-2	Improper rigging caused winglock pins to extend prematurely.
P-2	Failed to install all wing rib attach bolts.
P-3	Air conditioning exhaust duct clamp improperly torqued.
E-2	Port inboard wing fairing opened in flight.
C-1	Wing lock pins actuated prematurely.
C-117	Tail wheel tire exploded during disassembly.
C-121	Wing inspection plate left loose.

AT

A-4	Failure to properly latch the radome, caused loss in flight.
A-4	Failure to latch the radome.
P-2	Radio compartment hatch not properly secured.
P-5	Antenna end attached to bobbin wire stop hole vice bobbin swivel.

AE

F-4	Crew broke three wires in the fire warning circuit.
H-34	Improper installation of gyro and amplifier.
C-121	Shim plate for the blade switch was omitted during propeller buildup.

AO

A-1	Actuated wrong switch during an armament preflight.
A-4	Multiple bomb rack corroded.
A-4	Failure to inspect drop tank for fuel prior to releasing it from the rack.
A-4	Failed to disconnect the primary lead from the Aero 7A rack and failed to connect the lead to the A/A 37B3 PMBAR.
A-4	Failed to properly install an external fuel tank.

Inflight Loss

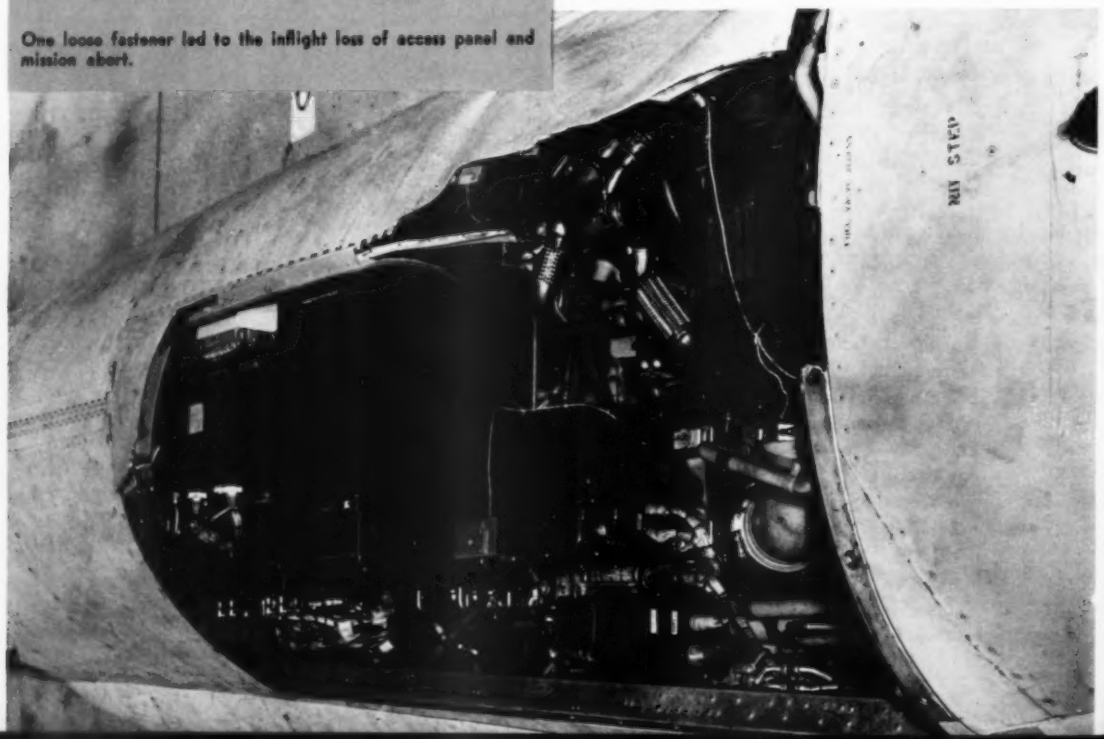
DURING an intercept at 15,000 feet, slightly nose down with a load factor of 4.5G the F-8 pilot felt a thump on the airplane. His wingmen noted the electronics access panel had come off. The thump was caused by the panel striking and puncturing the vertical stabilizer in several places. After a slow flight test for controllability the pilot landed the aircraft without further incident.

Examination of the fastener receases showed that the lower forward fastener had not been secured. This allowed a corner of the panel to raise and allowed air pressure to build up within the compartment. Four fasteners then parted one at a time, raising the corner of the panel into the windstream. At this time the panel parted from the aircraft.

Replacing a malfunctioning electronics part was only half the job, said the investigators, as evidenced by the result.

This maintenance goof, while typical of many of those reported here points up a serious flight hazard potential and at the same time reemphasizes the need for detailed attention to buttoning up an airplane The last phase deserves just as much attention as any other phase of maintenance for assured mission readiness.

One loose fastener led to the inflight loss of access panel and mission abort.



A-4	A 300-gallon fuel tank was jettisoned due to improper jettison circuit test.
A-4	Port drop tank was inadvertently jettisoned. Locally installed switch plate was not authorized type.
A-4	*Murphy's Law*—Cross-connected rack leads caused inadvertent jettison of a practice MBR.
A-4	Failure to comply with the HMI, two bombs separated on cat shot (2 cases.)
F-4	LAU7A latch not locked prior to launch.
F-4	Failed to properly load missile.
P-5	Bomb-bay fuel tank was inadvertently released on the seaplane parking apron.
S-2	Failed to properly service sonobuoy locking levers and latches.
C-1	Failed to install a safety pin in the Aero-14 rack (MX-900).

Plane Captain

A-1	Improperly secured cowling was lost in flight.
A-4	Improper torque of a hydraulic fitting caused a flight control system leak.
A-4	Failed to secure a lower fuselage access door.
A-5	Optical access door fasteners improperly secured.
F-1	Starboard inboard wing flap was lowered

into an oil bowser.

F-4 Port outboard L/E flap was damaged when lowered into a starting pod.

F-8 An aircraft left unsecured rolled into an elevator well.

F-8 Failure to properly secure an upper fuselage panel.

F-10 Pilots' lower escape hatch improperly secured.

H-3 Crewman switched from accessory drive to flight position with no. 1 engine turning.

H-3 A duct cover warning flag caused FOD to no. 1 engine.

H-34 A wooden mallet flew off the rotor head into the blades.

S-2 Life raft door was not fully locked; separated on catshot.

Other

A-4 Failure to secure the aft fuselage access door.

A-4 Fuel crew failed to heed proper precautions during refueling.

A-4 A rocket launcher was lost in flight; no instructions had been issued indicating special requirements (two aircraft).

A-4 Improper assembly of catapult hook during PAR.

A-4 Failed to detect a crack in an arresting hook shank during inspection.

A-5 Bomb rack was not properly locked prior to installing a 400-gallon drop tank.

F-4 The forward canopy was broken off when the aircraft was towed into an overhanging tarpaulin.

F-8 A flight deck crunch damaged the starboard wing.

T-1 A flight line vehicle collided with the aircraft.

T-1 Improper cockpit procedures caused fire and Alpha damage. See "Strike One." p. 38.

H-3 Two tail rotor blades were damaged by the flight deck elevator.

H-34 Insufficient aircraft clearance; the tail rotor struck another aircraft main rotor.

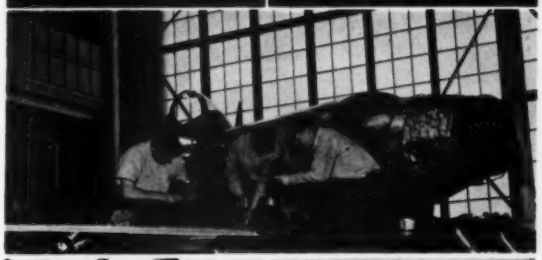
H-34 Crewman failed to properly lock the cargo hook; the cargo was lost (2 cases).

H-34 The sliding window release was partially actuated; window separated in flight.

P-3 An external power receptacle was torn loose by an unlicensed driver.

P-5 A forklift rammed into a wing float.

E-1 The starboard rudder trim tab was crushed during a hangar deck crunch.



Water-pumped nitrogen bottles are identified by two black bands on grey and by right-hand inside threads; oil-pumped nitrogen, one black band on grey and left-hand inside threads.

Tire Inflation—Nitrogen vs Air

SOME questions have come up concerning proper tire inflation practices, and especially concerning what gas to pump them up with.

Historically speaking, the trend has been from air to nitrogen as aircraft became faster and heavier, and tire temperatures became more of a problem. Nitrogen is now preferred, because the oxygen in air reacts with the tire rubber at high temperatures and pressures. This causes deterioration, reduces tire life, and presents a blowout hazard. In extreme cases it might be an actual fire hazard.

The maintenance manuals for earlier aircraft, call out either air or nitrogen. The F-4 series handbooks spell out nitrogen as the normal material, with air as an emergency substitute only.

Fine so far—but there is another aspect not defined by the manuals. There are two classes of gaseous nitrogen, as spelled out by Federal Specification BB-N-41 1a (which supersedes Mil-C-6011). Both are available in military supply. Class One is oil-free. This means that it is compressed by a water-lubricated (or non-lubricated) pump; it is commonly called "water-pumped" nitrogen. This is the nitrogen to use for filling aircraft tires. Class Two is defined as "oil-tolerant" nitrogen. This is compressed with an oil-lubricated pump, and hence is commonly called "oil-pumped" nitrogen. It may contain up to 0.5 percent contaminants, including entrained oil vapor.

The objection to using Class Two nitrogen in tires is that an oil film may build up on the inside of the tire, soaking into the pores of the rubber. This shouldn't hurt synthetic rubber, and doesn't present a combustion hazard in the presence of inert nitrogen. However, there comes a time when somebody runs out of nitrogen and uses the legal alternative—air. Now we have a hydrocarbon film in contact with compressed air, which is definitely a combustible mixture.

We don't mean that this is an immediate safety hazard, but it's an undesirable practice and should be avoided. There is an immediate safety hazard in having bottles of Class Two nitrogen around, however. That is the chance that somebody will use it to purge an oxygen system. Katy, bar the door. (See "One Bar, Two Bar, Fubar," July '63 APPROACH—Ed.)

So, what to do if you run out of Class One water-pumped nitrogen? Our engineers feel that it's preferable to use clean dry air rather than Class Two nitrogen.

The F-4 maintenance manual presently calls out Class Two nitrogen as the normal filling material; this is a mistake and will be changed.

—Adapted from McDonnell "Field Support Digest"

Grease Fitting Failure

INGESTION doesn't appear to be limited solely to engines. Gets rather sneaky, sometimes. To wit, a report from Flight Safety Foundation highlights inhalation of a slower sort, that of grease fittings being forced to swallow portions of themselves, causing insidious, creeping damage.

An airline discovered quite by accident that the small ball contained within a grease fitting was missing. This particular fitting was installed on the journal of the main landing gear trunnion. A more detailed examination revealed that the ball had escaped between journal and bearing, resulting in a serious scoring of the mating parts.

Engineers attributed their trouble to the fact that this grease fitting's outlet had a larger diameter than the ball. It was theorized that high grease gun pressure could allow the spring to open, allowing the ball to reach the bottom of the fitting. With an outlet of sufficient size, the ball would then be free to escape.

A second incident occurred when a flap jackscrew was found seizing for the same reason. A fleet campaign was then initiated to determine the condition of lubricators. In several cases it was discovered that the balls were missing and that most fittings had an outlet large enough to allow the ball to escape.

As a result, an individual inspection of fittings supplied through normal channels from the manufacturer resulted in the rejection of almost all fittings because of oversized outlets.

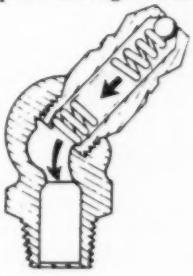


FIGURE 1

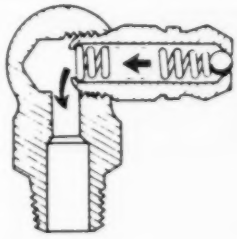


FIGURE 2

Figures 1 & 2 show escape route of grease fitting ball.

Later on it was discovered that many of the lubricators developed cracks in the swaging area due to the increase in swaging pressure in an attempt to keep hole size at a minimum. These cracks could have been the cause for both spring and ball escaping.

As far as we know, occurrences such as this haven't happened to us. Something to think about—such as: if a fitting ball disappears, where did it go?

Blow Plot

WHILE Anymouse was preparing to preheat an aircraft with a portable Herman-Nelson heater, he experienced an explosive light-off, receiving burns of the face and hands.

This Anymouse was an inexperienced lineman totally unfamiliar with the heater. He had overprimed the gasoline-fired burner element and then lit it off with a match. The resulting large puff of flame emitting from the burner housing inflicted injury.

According to the report, this incident could have been easily avoided by having an experienced man light off the heater but due to expediency and lack of personnel at the time, a short cut was taken which could have terminated in tragedy for both man and aircraft.

Ed's Note: Handbook instructions state that a wick type torch lighter is to be used for this purpose. The wick of the torch lighter is thrust into the fuel of the burner assembly to moisten the wick. The wick is then lit with the spark lighter and the gasoline in the burner in turn is lit with the torch.

Connector Care

A HIGH number of reports indicate that electrical failures are due mainly to improper installation and handling of the electrical connectors.

Most common is the jamming of a plug into a receptacle, or inserting and turning the plug until it looks like it is aligned or a "fit" is made. Either of these practices can cause bent or broken pins and electrical failures in turn.

Improper handling such as stowing plugs uncapped and the dropping of plugs can result in damaged or shorted connectors.

To avoid electrical failures and troubleshooting headaches caused by faulty connections, always check for bent or broken pins before mating a plug with an electrical connector. Also, check that connector keyways are aligned. If a pin becomes broken or bent, the pin should be replaced if a removable pin-type is used. If it's a solder-type connector, replace it. As Carol Burnette says, "Watch It!"

Inflight Blowup

HERE'S an Anymouse report of an incident that's well worth noting and tucking under our hats for future reference.

In flight a P-2 Electronics Tech observed a red light on the APS-20 control box. Suspecting an air

leak, he entered the radar well to check the transmitter and high voltage power supply. Knowing that the transmitter had recently been worked on, he focused on a marman clamp which appeared to have about ¼-inch too much spacing on it.

He was fully aware that the "hat" which was held on by the clamp was pressurized by a large volume of air (15 psi or more) and began to adjust the clamp. Eight turns on the screw caused the improperly installed T-bolt to loosen and blow the "hat" clear off, denting the overhead. The assembly was clearly labeled, "Do not remove clamp when pressurized."

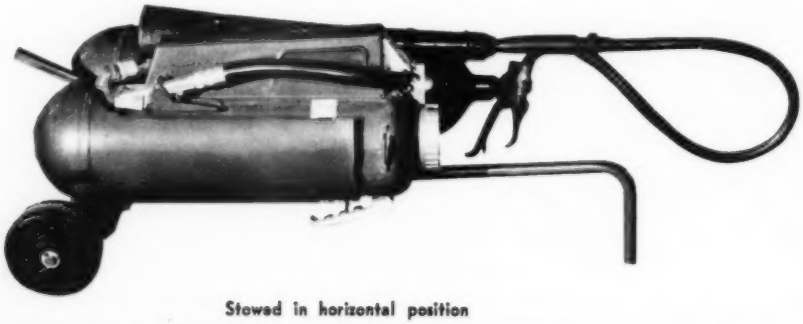
The huge "hat" would have pulverized the Tech's head had he not been "½-inch short."

Anymouse also reports that the "Electronics Digest" of Feb. '61 disclosed a death due to this device, reemphasizing the point that someone will always take a needless short-cut inviting disaster.

Fire Bottle Racks

WHAT appears to be a good idea in the way of stowing and moving portable fire extinguisher bottles on the flight line, hangar and operations areas was developed and built by NAS Dallas. It is illustrated here for possible adoption by other activities. The rack holds one 30-lb. Purple "K" and one 15-lb. CO_2 extinguisher.

Stowed in upright position



Stowed in horizontal position

A list of materials and cost per unit follows:

Stock/Part No.	Description	Approx. Cost
RS2530-517-1391-GH80	Wheel, assy (2)	$6.00
(Mk-15) 1325-038-4819-E980	Bombs, practice (2)	scrap/salvage
1¼" O.D. x 6' long	Pipe, steel (used)	1.30
½" x 3" x 15"	Strip, steel	1.00
¼" x 1" x 12"	Strip, steel	.40
½" O.D. x 12"	Rod, steel (axles 2)	.50
	Total	$9.20

—Contributed by LCDR K. H. Tribou

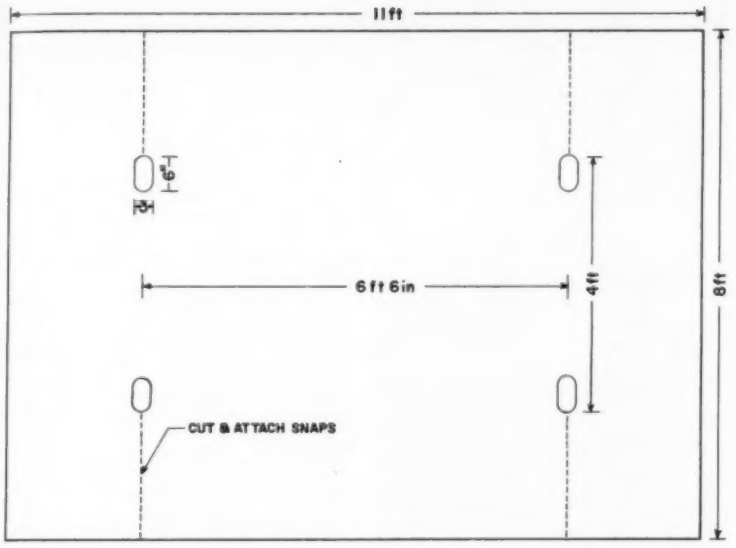


Fig. 1 Detailed dimensions

FOD Prevention Aid

A CATCH-ALL fitted for use with 4000A logistics stand is reported to be an effective FOD prevention aid. VA-66, using this homemade device cites benefits in addition to trapping debris such as nuts, bolts, cotter-pins, washers, and wire clippings before it becomes on-deck litter, namely:

- Prevents damage to accidentally dropped accessories
- Permits easy retrieval of dropped tools
- Saves wear and tear on dungarees
- Provides neat working conditions

A medium grade, non-waterproof material which allows drainage of leaking fuel, oil or hydraulic fluid is best suited for this purpose. It can be made by riggers by simply cutting, hemming and inserting snaps according to the dimensions in the sketch, Fig. 1. Installation is as indicated in the photo, Fig. 2.

The catch-all is installed on the stand just after withdrawal of the engine from the aircraft and remains in place until the engine is ready for installation.

Logistics stand 4000A is utilized in maintaining F-8, A-4, F-4 and A-6 aircraft; therefore, the dimensions shown can be used by those adopting this idea.—*Contributed by A. H. Engemann, ADJ1, ComFAir 4 & 5, NAS NorVa (formerly with VA-66).*

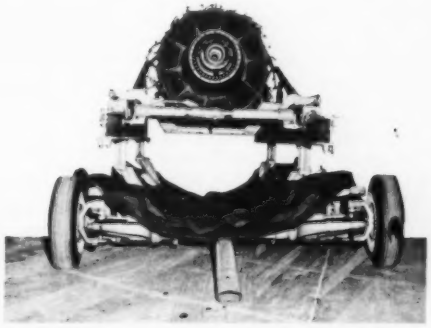


Fig. 2 Catch-all installed

Clean Up and Clear Up

PARTICLES of metal left in the tanks of F-4s following a wing mod (ASC 151) contaminated the base of tank units causing inflight low level fuel warning light to come ON. In one case the pilot noted the fuel quantity gage reading 2500 lbs.

Several similar cases by the reporting activity cited all fuel quantity discrepancies have been the result of contamination on the base unit and that cleaning of the unit corrected the discrepancies.

It was recommended that O&Rs initiate procedures to prevent recurrences and that the contractor consider a design change by adding a protective screen to the unit.

From the mechanic's point of view, it would seem that a thorough clean-up before buttoning up would be that ounce of prevention.

Instrument Illumination

FPO New York—Complete generator failure in the P-3A will result in reliance on the battery for a source of inverter, instrument and light illumination power. An independent properly located light source is required for such an emergency at night or during flight in actual instrument conditions.

In December, this squadron installed cylinders on the copilot's chair pedestal in the aircraft (see photo). The cylinder has reflective tape around the top. The tube is cut to house a flashlight which can be easily grasped by either the copilot or the flight engineer and yet is not in the way nor likely to be thrown out in severe turbulence or maneuver.

Included in our training are drills for the copilot to reach for the essential bus switch and then drop his hand to grasp the flashlight while the flight engineer prepares for pulling the boost handles on the pilot's command.

Since installation other ideas have been generated such as buying the "L" shaped Boy Scout Flashlights and mounting them on the yokes.

Until a better means has been developed to insure emergency illumination and availability of essential instruments, the above flashlight installation and essential bus switch operation are submitted for our sister P-3A squadrons' consideration.

P. J. MALLOY, LCDR
ASO, VP-44

• Your installation and emergency procedure looks good from here. Paragraph 6 a. of BuWeps-Inst 13050.6 of 8 March 1963 is quoted in part: Where material defects or unsatisfactory conditions exist, recommendations for the correction of such deficiencies shall normally be made through the submittal of FUR reports of the Electronic Failure Report (EFR). However, when considered desirable, activities are permitted to make a trial installation of a proposed modification in one unit provided that:

- **Special procurement of material is not required beyond existing local purchase authorization.**
- **Operational or personnel safety is not impaired.**
- **Performance characteristics are not adversely affected and the approval of the cognizant major controlling custodian is obtained.**

LSO Radios

San Diego—The article, LSO Radios, "The Indispensable Right Hand," in the January 1965 APPROACH did an excellent job of describing a definite operational problem area.

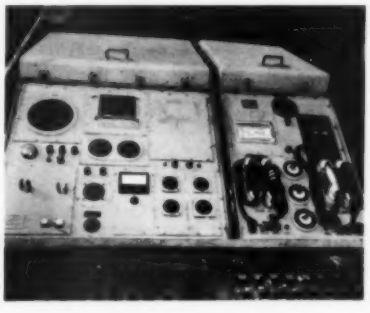
A standardized LSO Console has been designed by the Naval Air Engineering Laboratory (SI) at the request of BuWeps.

Below is a picture of one of these consoles. Installation has been accomplished in the following NavAirPac carriers.

USS HORNET
USS ORISKANY
USS CORAL SEA
USS HANCOCK
USS MIDWAY

Eventually, all carriers will be equipped with this console.

L. S. ELLISON, CDR
COMNAVAIRPAC STAFF



Spectrometric Oil Analysis Film

Vance AFB, Okla.—The Air Force has recently adopted the spectrometric oil analysis program and this AFB has been assigned the pilot program for T-38 aircraft.

When training our maintenance personnel we use an AF Training Film No. TF-5706, entitled "Spectrometric Oil Analysis." This film was originally produced by the Navy and has only in recent years been reproduced for AF use. Since the AF is just entering the spectrometric program there is a great demand for this film and our Film Library at St. Louis is unable to provide us with a copy. Knowing that the Navy has been in this program for some time, I am hoping you can obtain a copy of this film for us on a loan basis.

If you do not have access to this film, please pass this letter to the applicable addressee.

IRA D. HALE, JR.
CAPTAIN, USAF

• The Navy number for this film is MN9585. Your request was forwarded to the FAETULant Aviation Training Aids Film Library, NAS Norfolk, Va., for appropriate action. Other sources of this film clude Naval District Film Libraries; NARTUs; FAETUPac, NAS North Island; and FAETU Detachments as follows: NAS Brunswick, Me.; NAS Jacksonville, Fla.; NAS Quonset Point, R. I.; NAS Patuxent River, Md.; NAS Oceana, Va.; NAS Sanford, Fla.; NAS Key West, Fla.; Naval Station, Roosevelt Roads, Puerto Rico; NAS Moffett Field, Calif.; NAS Whidbey Island, Wash.; NAS Lemoore, Calif.; NAS Miramar, Calif.; NAS Ream Field, Calif.; NAS Alameda, Calif.; NAS Naha, Okinawa; NAS Barber's Point, Hawaii; NAS Guam; NAS Sangley Point, P. I.; and NAS Atsugi, Japan.

Folding Arm Rests

FPO San Francisco—The folding arm rests on the flight deck chairs of the SP-2H are a hazard to safety. They invariably seem to go to the folded position at some time during flight and the "T" portion of the arm rest locking mechanism can, and often does, become entangled with the occupant's chute harness hardware.

Superintendent of Documents
U. S. Government Printing Office
Washington, D. C. 20402

Please send APPROACH (NavWeps 00-75-510) for one year to the following address. Enclosed is a check or Money Order for $3.50. ($4.50 for foreign mailing).

Name .....

Address .....

City ..... State ..... Code .....

It's merely a nuisance during the bailout or ditching drill, but in a non-drill situation the ten or fifteen seconds it takes to become disengaged from the seat may be that one second too much.

The arm rests are too small to be of much use anyway, so let's remove them altogether. Anybody agree?

ASW TACCO

• As far as we know, the subject has never been brought up before, but it sounds like you have a good idea. An informal canvass of Center personnel having former P-2 experience supports your view concerning the possible nuisance/hazard aspects of these arm rests, particularly when they are in the folded position.

Directions for submitting proposed modifications to naval aircraft and related equipment are contained in BuWepsInst 13050.6 of 8 March 1963.

Safety Memo

NAAS Chase Field—Use of a squadron safety memorandum form has proved quite effective in our aviation safety program (see below).

This form serves as a quick cover letter when attached to safety material such as *Crossfeed*, APPROACH and various bulletins. It also provides space for the safety officer to make appropriate comments and/or call particular attention to a certain item in the attachment.

A carbon copy of each memorandum sent out goes into a tickler file for follow-up purposes. This tickler file in turn provides firm proof of the continuing existence of an aggressive aviation safety program . . . hard-to-nail-down evidence like this is especially nice to have during AdMat inspections.

M. L. JINES, LT
ASO, VT-24

• Sounds like it works well for you. Perhaps others will find it useful also.

SAFETY MEMORANDUM

From: Aviation Safety Officer
To: _____
Subj: Safety Information; dissemination of
1. Your attention is invited to the following matter which is within your cognizance: _____
_____
_____

2. Please return this memorandum with your comments and/or suggestions,

Respectfully,
_____

FIRST ENDORSEMENT

Date _____

From: _____
To: Aviation Safety Officer
_____
_____
_____

(Continue on reverse if necessary)

For Pop Top Oil Cans

NATC Patuxent River, Md.—I read C. T. Denison's excellent suggestion for putting pop-top openers on Navy oil cans in the November '64 issue followed by comments about resultant FOD problem if it were adopted.

It has apparently not occurred to you that it is perfectly simple to make pop-top cans that leave the pop-top attached to the can when it is opened. Just leave a portion of the pop-top section unscored.

JOHN D. WISE
FIELD SERVICE REP
DOUGLAS AIRCRAFT CO. INC.

• Thank you for the suggestion. Your letter is also being forwarded in support of the pop-top idea.

Is it Really Safer?

NAS Dallas—A question of safety has arisen among our shop personnel concerning the safety equipment used in filling aircraft with liquid oxygen. The clothing and safety equipment is stated as white coveralls, gloves, face shield, safety shoes, and last, and by far the big hazard, the rubber apron. This equipment is stated in BuWeps Inst. 10332.4 as of 6 July 1964.

The equipment used should be utilized for safety in all respects. The rubber apron (FSN D8415-273-3966) is actually a hazard more than a help. This apron is hazardous in several respects during filling operations. Instead of being a shield, it acts as a funnel if your arms are anywhere in front of you. The size of this apron is also a hazard. The apron is so long that it creates a hazard as far as moving around. I am over six feet tall and these so-called safety features trip me nearly every five or six steps. For a shorter man, it is nearly impossible to move. The weight of this apron also presents a problem.

If a man were to have to move in a hurry, he would just be out of luck. This apron will completely go around a man and have the effect on him that a tight skirt has on a woman. This is no good for fast movement. And if the wind catches it—*look out.*

If a man really looks at this apron from all angles, he would see it as a hazard, not safety equipment.

B. MCCARLEY, AMH-3

• The hazards presented by the rubber apron have been reported by several sources. Yours is typical from users in the fleet. While it is recognized that protective clothing is a vital necessity for those who handle volatile materials, it is agreed that poorly designed and poorly fitted garments may well increase the hazard rather than improve safety. Consequently, Commander NASC has recommended to Chief, BuSandA that an evaluation be made of this item to determine if an improvement can be made.

Vol 10 **approach** No 10

Our product is safety, our process is education and our profit is measured in the preservation of lives and equipment and increased mission readiness.

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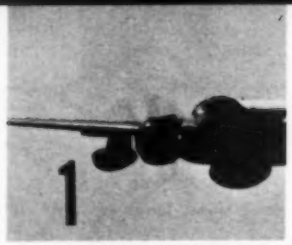
DEPARTMENTS



NavWeps 00-75-510

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CODE OF CONDUCT FOR PROFESSIONALS

He will accept the responsibilities as well as the rewards for authority.

He will so conduct himself at all times as to merit the confidence and respect of his fellows, associates and superiors.

He will consider the acquisition of skill and knowledge in his profession as a never ending process and will accept the responsibility of study, research and investigation in his field.

He will faithfully discharge the duties assigned him to the best of his ability.

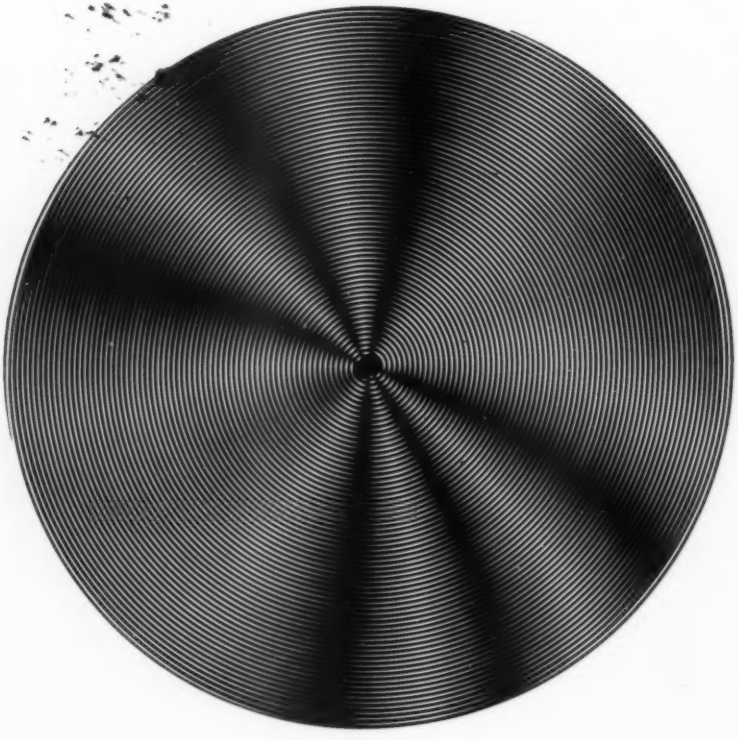
He will keep uppermost in his mind the safety and well being of those who depend on him.

He will conduct his affairs with others in such a manner as to bring credit to the Navy, to aviation, and to himself.*

**For more on this code, developed by Cdr. Homer C. Rose, please review your January 1960 and November 1962 copies of* APPROACH—ED.

LIFT and DRAG

BEWARE
the SPINNING PROP!



Don't be a fatigue failure
Wake up to safety.